THE UNIVERSITY OF TEXAS AT AUSTIN Date: 09/17/2014

RECOMMENDATION FOR CHANGE IN ACADEMIC RANK/STATUS

Name: Georgios-Alex (Alexandros G.) Dimakis EID: gd6366 Present Rank: Assistant Professor

Years of Academic Service ***(Include AY 2014-15 in each count)***:

At UT Austin since: 01/16/2013 (month/day/year) In Present Rank: 2.50 (# of years) In Probationary Status (**TT only**): 2 (# of full years or N/A)

Primary Department: Electrical and Computer Engineering College/School: Cockrell School of Engineering

Joint Department: - College/School: -

Other Department(s): -

Recommendation actions[1]:

By Budget Council/Executive Committee: Promote

Vote[2] for promotion 31; Against 0; Abstain 3; Absent 1; Ineligible to vote 0

By Department Chair: Promote

Vote for promotion _____; Against _____; Abstain _____; Absent _____

By College/School Advisory Committee: Promote

Vote for promotion 7; Against 0; Abstain 0; Absent 0

By Dean: Promote

Administrative Action: Promote to Associate Professor

Date Action Effective: September 1, 2015
(To be submitted to the Board of Regents as part of the annual budget.)

By: _____ Date: December 17, 2014
For the President

[1]See "Chart of Recommended Actions" for eligible recommended actions applicable to specific conditions and administrative levels.
[2]Record all votes for and against promotion, abstentions by eligible voting members, and the number of absent eligible voting members. The number of budget council/executive committee members ineligible to vote due to rank should also be recorded. Enter zero where it would otherwise be blank.

EVPP/10.14

EXHIBIT
P's 165

THE UNIVERSITY OF TEXAS AT AUSTIN
COCKRELL SCHOOL OF ENGINEERING

Office of the Dean • 301 E. Dean Keeton Street, C 2100 • Austin, Texas 78712-2100

Dean's Assessment
Alex Dimakis
Department of Electrical and Computer Engineering

Alex Dimakis completed a Diploma in Electrical and Computer Engineering from the National Technical University of Athens in 2003. He subsequently received an MS (2005) and a PhD (2008) in Electrical and Computer Engineering from the University of California, Berkeley. He was a post-doctoral scholar at the California Institute of Technology for one year. Dr. Dimakis was then appointed as an assistant professor at the University of Southern California, where he served on the faculty for three and a half years (May 2009 to December 2012). He joined the Department of Electrical and Computer Engineering at the University of Texas at Austin as an assistant professor in January 2013. He has been at his current rank at UT Austin for one and a half years. This case is considered to be early if only the time at UT is considered. However, if this case is successful and if his time at USC is considered, Dr. Dimakis will have served as an assistant professor for a total of six years.

A total of ten external review letters were received, of which five were from reviewers selected by the budget council and five were recommended by the candidate. The letter writers are all experts in the field of coding theory and communications and were chosen from domestic peer institutions (Stanford, UC Berkeley, UC San Diego, Duke, and Maryland), industry (Bell Labs), and international universities (Indian Institute of Science, Toronto, Chinese University of Hong Kong, École Polytechnique Lausanne). One referee is a member of the National Academy of Engineering.

Teaching
During his time at UT Austin, Dr. Dimakis taught one undergraduate course (EE 313, *Linear Systems and Signals*, twice) and one graduate course (EE 381V, *Advanced Coding Theory*, once). He also taught four graduate level courses at the University of Southern California. These courses were on coding theory, advanced coding and information theory, probability, and message passing theory.

Based on student comments and peer evaluations, it can be concluded that Dr. Dimakis is an excellent teacher. His undergraduate instructor ratings range from 4.0 to 4.4. The 5-year average instructor rating for assistant professors in the Cockrell School of Engineering is 4.1. Dr. Dimakis' teaching performance is therefore better than the CSE average scores. His average course rating for EE 313 is 3.90. His instructor rating in the graduate course is 4.6, which exceeds the average for assistant professors in the Cockrell School (4.08). His average course rating for EE 381V is 4.47. Dr. Dimakis' instructor ratings at USC ranged between 4.4 and 4.8 on a 5-point scale.

The peer assessment of Dr. Dimakis' teaching emphasizes his energetic teaching style and his ease of communication and is consistent with positive student comments the candidate has received in his courses.

Research
Dr. Dimakis' research is in the areas of information theory, coding theory, machine learning and networking. He has made important contributions to the theory and implementation of distributed storage codes especially to solve problems encountered when erasure codes are used to protect information stored in a distributed manner over multiple machines in a data center. Dr. Dimakis has continued the trend-setting research in the area of distributed storage that he started at USC and during his time at UT Austin has made forays into other areas such as the analysis of gossip algorithms and exploring the connection between linear programming (LP) based decoding of binary codes and compressed sensing.

Dr. Dimakis has published ten papers at UT Austin, and a total of 25 papers in-rank when his time at USC is included. Over his entire career, he has published 29 journal publications. Most of his publications are in various *IEEE Transactions* which are acknowledged to be among the most prestigious in his field. He has also written 44 refereed conference papers while in rank, of which twelve were presented during the time Dr. Dimakis has been at UT Austin. Over his career, he has published 60 papers in refereed conference proceedings. A number of his publications are with graduate students both here at UT Austin and at USC.

Some of his research highlights include: (1) Dr. Dimakis' publications have been cited 3632 times with an h-index of 30 (Google scholar) since 2009. The budget council presented a comparison of Dr. Dimakis' research productivity to other recently promoted faculty members, which indicates that Dr. Dimakis is more productive and better cited than any of the members of the comparison group. (2) Dr. Dimakis has been invited to give several talks at universities and symposia. He was the keynote speaker at the IEEE International Symposium on Network Coding. He was invited to make a presentation at the Network Information Theory meeting at the Banff International Research Station.

Dr. Dimakis has received funding from eleven research grants over the course of his career and is the PI on eight of those grants. He has been awarded seven research grants during his time at UT Austin and is the PI on five of those. He has raised over $3.4 million in research funding over the course of his career with his share at $1.8 million. His share of research funding while at UT Austin is approximately $1.1 million. Prominent research grants include the NSF CAREER award that he received when he was at USC, a Google Research Award that he received in 2012, and a prestigious Young Investigator Award from the Army Research Office (ARO). He has three other awards from NSF. Dr. Dimakis' research is of direct relevance to organizations that are engaged in big data analytics using clusters and cloud storage systems and this is likely to sustain his research program for a long time. In the words of Raymond Yeung (Chinese Univ. of Hong Kong), "*the technology developed by Dr. Dimakis and his students/co-workers has the potential to become the core technology for next generation cloud storage.*"

Dr. Dimakis received exceptionally strong reviews from all the letter writers. Some select comments are presented below:

> Dr. Venkatachalam Anantharam (UC Berkeley) writes, "his research in coding for distributed systems has set a veritable hailstorm of research: there are already conferences devoted purely to distributed data storage, and there are many groups around the world working on this topic."
>
> Dr. Alexander Barg (Maryland) writes, "The works of Dr. Dimakis in this area have had a significant impact on the development of coding theory: it is fair to say that to some extent they have shaped subsequent research devoted to coding for data centers."
>
> Dr. Robert Calderbank (Duke, NAE), "If I were to ask a two part question - What was the idea and what difference did it make? – then I would find it difficult to rank anyone ahead of Alex."
>
> Dr. Rüdiger Urbanke (École Polytechnique Fédérale de Lausanne) writes, "Together with some of his colleagues he has created a whole new branch of coding theory that takes into account the unique requirements of this field. This has led to the definition of a research area that is at the same time very beautiful and eminently useful. This does not happen every day!"

Advising and Student Mentoring

Dr. Dimakis graduated one PhD student at UT and one co-supervised PhD student at USC. He also graduated one MS student at UT and three at USC. He is currently the sole supervisor of two PhD students and co-supervisor of two others (two additional PhD students joined his group in September 2014). While in rank, he has also formally supervised a senior design team comprising five ECE undergraduate students. He also co-supervised an

undergraduate student researcher from Rice University. Dr. Dimakis currently supervises two post-doctoral research fellows.

University Service

Dr. Dimakis has served as a member of the ECE Semester Course Evaluation Committee and the CommNetS Pre-Qual Screening Committee for 2014. He has also served on the CommNetS Graduate Admissions Committee for 2013 and 2014. The Budget Council statement observes that service on the Graduate Admissions Committee is a particularly time-consuming commitment. In 2013, he served as program chair of the Winedale Workshop, a one-day event co-organized by UT Austin, Rice University and Texas A&M to facilitate interaction between Texas researchers in the area of signals, systems and communications.

Professional Service

Dr. Dimakis is an associate editor of the IEEE *Signal Processing Letters*. He has served on over 15 technical program committees for key conferences in his area (such as ISIT). He has also chaired an IEEE workshop on Emerging Data Storage Technologies in 2012, participated in two workshops sponsored by NSF. Recently, Dr. Dimakis was appointed to the eight member committee that is investigating future directions in information theory. He has served on several funding/review panels for NSF and other international academic organizations. He has reviewed papers for virtually all the top IEEE journals pertinent to his area.

Other Evidence of Merit or Recognition

Dr. Dimakis received the Joint Paper Award in 2012 from the IEEE Communications Society and the IEEE Information Theory Society. This is a very prestigious award, with only one paper per year recognized across a wide diversity of journals in the two IEEE societies. He delivered the keynote address at the 2010 IEEE International Symposium on Network Coding. He received a NSF CAREER Award in 2012 and an Army Research Office Young Investigator Award in 2014. He was invited as a school lecturer at the European School of Information Theory.

Overall Assessment

Dr. Dimakis is clearly an outstanding researcher who has continued down the path he set at USC and has established a strong research program here at UT. He is engaged in trend-setting research in the area of coding for distributed systems, gossip algorithms, LP decoding and machine learning. He has excelled at teaching and has been complimented by the students for being patient, energetic and an excellent communicator. He has received several prestigious awards that recognize his research credentials. He has performed adequate service to the university and department and has maintained an active role in his profession by serving as the associate editor of the *IEEE Signal Processing Letters*.

I believe that Dr. Dimakis meets or exceeds all expectations for early promotion to associate professor, and support this case without reservation.

Sharon L. Wood, Dean
8 November 2014

ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT
Cockrell School of Engineering

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http://www.ece.utexas.edu/

September 24, 2014

Chair's letter in support of the promotion of Prof. Alex Dimakis to the rank of associate professor with tenure

Prof. Dimakis joined the Department of Electrical and Computer Engineering in January 2013. If promoted to associate professor in September of 2015, he will have served as an assistant professor at the University of Texas at Austin for two and a half years, and the University of Southern California and the University of Texas at Austin for a combined total of six years. Therefore, his case is an early promotion case based solely on the length of his service at the University of Texas at Austin.
Alex is a pioneer and star in coding for distributed storage systems devices, a rising star in information and coding theory more generally and machine learning, and also an excellent teacher. The Budget Council recognized his strong accomplishments and determined that he meets all expectations for promotion at the premier departments of Electrical and Computer Engineering in the nation by a vote of 31 YES, 0 NO and 3 ABSTAIN. Our associate professors voted 7 YES, 0 NO and 1 ABSTAIN in support of promotion.

Teaching

Prof. Dimakis is an excellent teacher. Since he arrived at UT, he has taught our core undergraduate signals and systems course (EE 313) twice, and an advanced coding theory course (EE 381V) once. His instructor scores in both undergraduate and graduate courses clearly indicate that he is a dedicated and engaging teacher, with undergraduate instructor scores of 4.0 and 4.4 and a graduate score of 4.7. It is worth mentioning that EE313 is one of the two most difficult and rigorous courses that all our undergraduates have to take. His instructor scores in the graduate classes that he taught at the University of Southern California are no less impressive, ranging from 4.4 to 4.8.

Students overwhelmingly praise Prof. Dimakis in their comments, noting that he is both informative and entertaining while teaching a difficult subject, dynamically adjusts the pace of the lecture to the understanding of the students, and provides real world engineering examples to motivate the highly mathematical material covered in EE313. "Great lecturer" is a description that shows up most frequently in the students comments. The peer evaluations also paint the picture of a highly energetic teacher with a deep knowledge of the material who is very well organized and knows how to motivate the difficult material that he is covering.

Research

Alex is best known for his work in the area of coding for distributed storage, a field that he pioneered in his PhD work. Classical coding theory focuses on minimizing the amount of redundancy needed to achieve a desired reliability. Classical theory assumes that the original data and additional redundant information are co-located. However, the advent of distributed storage meant that co-location no longer applied. In particular, failure of a storage device at one location would require moving large amounts of data from other locations that store the redundant information required to reconstruct the failed storage node, taxing networking resources. In his PhD thesis, Alex identified the trade-off between minimizing redundancy and maintaining the locality of the information required to recover the data that was stored on the failed storage device. Furthermore, in this work and subsequent works that he did after graduation, Alex clearly highlighted the connection between coding for distributed storage and network coding. As Prof. Tse (Stanford) states in his letter "I would say this direction that was started by Dimakis is the most significant and promising one in network coding since it was invented 15 years ago, and in fact this direction is one of the most exciting in information theory overall in the past few years." The seminal paper that Alex and his co-authors from Berkeley wrote in 2010 that established the field of coding for distributed storage received the highly prestigious Joint IEEE Information Theory and Communications Society Best Paper Award in 2012. The paper is now a classic.

After graduation, Alex continued to advance the field of coding for distributed storage. However, instead of focusing on this work which is well described by the reference letter writers, I would like to highlight the work that he did in 2012-2013 on the concept of codes with locality, a competing approach developed independently by a team at Microsoft about the same time that Alex was developing his theory of coding for distributed storage. In a keynote address to the Workshop on Big Dynamic Distributed Data (a highly unusual honor for a junior researcher like Alex) he presented a novel class of codes with locality and, most importantly, reported experimental results from deploying these codes in Hadoop Distributed File Systems implemented in Amazon Elastic Compute Cloud (EC2) and on a Facebook cluster. Alex's approach led to a 50% reduction in data traffic for failure repair in both systems and a minimum increase in the redundant information stored locally. This work clearly established Alex as unique amongst researchers in information theory: unlike his peers, he is a great theorist *and* a great experimentalist who is focused on real practical problems and implementations.

Alex has made several other contributions to other areas in the past years, as noted by the reference letter writers. I note in particular the very recent work that he did on non-negative sparse principal component analysis in which he provided performance guarantees for an approximation to the solution of a well-known NP – hard problem. I would also like to highlight the fact that, to my knowledge, Alex was the first person to prove a conjecture made by two famous mathematicians, including a Fields medalist, Candes and Tao, by showing that a linear programming relaxation used in compressed sensing is connected to the fundamental polytope used in the analysis of LDPC codes. Both of these impressive works were done at UT.

Instead of describing other major contributions of Alex in the past few years, I will quote Prof. Kschischang (Toronto and Fellow of the Royal Society of Canada) who states that "All of this work would certainly be sufficient for promotion to Associate Professor with tenure at any top university. But Alex's work does not stop here. Alex has made fundamental contributions to gossip algorithms, to problems of distributed caching, to machine learning, and to index coding! According to Google Scholar, Alex's papers have been cited over 3600 times, which is indeed an impressive statistic for any researcher just six years beyond the completion of his Ph.D."

Alex's star status is recognized by his peers, as clearly demonstrated by the reference letter writers and by the remarkably high number of invited and keynote talks for a researcher of his age that he has given at top academic institutions, corporations, high visibility conferences and workshops.

Prof. Dimakis is very well funded by highly competitive peer-reviewed grants from NSF and DOD. He has received an NSF Career Award, an Army Research Office Young Investigator award and several industry gifts or awards. I expect his funding to increase even further as a result of his breakthrough inventions in the last few years.

Our department has adopted the practice of comparing each colleague with his or her most prominent peers at the first-tier departments in Electrical and Computer Engineering, such as MIT, Stanford, the University of California Berkeley, the University of Illinois Urbana-Champaign (UIUC), Georgia Tech, Caltech and Princeton. My colleagues and I selected Prof. Adam Wierman (Caltech) and Associate Professors Lizhong Zheng (MIT) and Aaron Wagner (Cornell) to be the peer comparison group for Alex. Zheng and Wagner were promoted to the rank of associate professor with tenure in 2008 and 2012. Wierman was promoted directly to the rank of professor in 2012 as is now customarily done at Caltech. The comparison shows that Alex is far more productive than any of the other three professors at the time of promotion. Despite being more junior, he is also currently better cited than any of the three other professors. Furthermore, while no single index can capture the impact of a researcher's work, I note that Alex has a much higher H index than this peer comparison group. Unlike the three other professors, he has made theoretical and experimental contributions that are influencing how large corporations such as Microsoft, Google and Facebook are designing and deploying their next generation distributed storage systems. It is no surprise then that the reference letter writers all strongly endorse promotion and implicitly support Prof. Tse's (Stanford) final conclusion: "Given the originality, depth and breadth of Professor Dimakis' contributions, spanning from theory to practice, I have no doubt that he deserves tenure. The field of information theory needs young people like him who are fearless in exploring new research directions."

Service

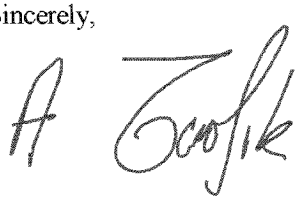
Alex has provided excellent service to both UT and the profession. Details can be found in his resume and the budget council statement. I will note in particular that Alex played a key role in the success of the annual Texas Wireless Summit event organized by our WNCG group last fall. I expect him to also play a key role in the next event that we will organize in Silicon Valley to highlight the accomplishments of our department and UT in general in the high-tech arena.

Summary

Alex is an excellent teacher and, in my opinion, already a star in information coding theory with a highly unique mix of deep and impactful theoretical and experimental contributions. He has served UT and his profession well. When we hired him two years ago, all premier departments of electrical and computer engineering took notice. He epitomizes the characteristics that we seek in all faculty

members in a department striving to become a top five department and I strongly endorse his promotion to associate professor with tenure.

Sincerely,



Prof. Ahmed H. Tewfik
Cockrell Family Regents Chair in Engineering
Chairman, Department of Electrical and Computer Engineering

ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT
Cockrell School of Engineering

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MEMO

TO: Sharon L. Wood, Dean Cockrell School of Engineering
FROM: Ahmed H. Tewfik, Chair Dept. of Electrical and Computer Engineering
DATE: November 20, 2014
SUBJECT: Abstention votes in the promotion case of Prof. Alex Dimakis

As noted in my September 24, 2014, chair's letter for the promotion of Prof. Alex Dimakis, three Budget Council (BC) members abstained from voting. In addition, Prof. Robert Metcalfe did not cast a vote on any of the ECE promotion cases. Prof. Metcalfe explained his decision to abstain on August 29, 2014, by stating "Am not voting because my appointment is 0%, and I do not know the candidates well enough."

As the comments provided below clearly indicate, the abstentions reflect some of my colleagues' uneasiness with such an early promotion. Alex' case is so compelling however that my colleagues most likely elected to abstain rather than vote no.

I provide below all the anonymous comments that we received from BC members during the voting process. As you will note, all the comments point to an extremely strong case.

Verbatim anonymous comments from BC members:

Truly outstanding research and teaching record as an Assistant Professor over the five years in rank.
Alex Dimakis is particularly outstanding. He should quite obviously be promoted.
An exceptional Assistant Professor Candidate. He has already established himself at a leader in his field, and made several significant contributions. This is not just my perhaps partial assessment, the referees provide ample evidence to support this point as well as a body of work that is deep and well cited. He seems to be doing well on all fronts, e.g., supporting his research, teaching contributions etc.. I strongly support this candidate for promotion.
He is a superstar and must be promoted but the low amount of time he has on UT ECE faculty is of some concern. The same previlege has not been given to many others in the past. Past is okay. But at least in the future, similar candidates must be given similar opportunities. Different early promotion standards have been applied to different people in the past.
Excellent research, teaching and service record. Research has had a significant impact.
This is one of the strongest tenure cases I've ever seen. It should be emphasized that not only are the Reference letters incredibly positive about Alex's work and impact, they are also an incredibly distinguished group of the world's top minds in his broad research area, and many of them are known to write quite critical letters.
This is an extremely strong case, particularly with respect to research accomplishments and impact, which are stellar. Both Alex's overall career record and his accomplishments at UT easily warrant promotion at this time.

He is great.
Alex Dimakis is, by all measures, a super star. It is imperative that we retain him on our faculty. He will make substantial contributions to our mission for the foreseeable future.
Based on several detailed conversations with him, I find Alex to be profound and intellectual as well as full of enthusiasm and drive. It is not surprising that he is already very well known and has garnered several best paper awards in top conferences, invited talks, etc. Adding in the time he spent at USC, this should not be considered "too early", given what he has achieved so far.

Very difficult question, since he only has been at UT for 1.5 years.
We have an opportunity to have a real superstar. I suggest we continue to seek new and significant ways to keep him here.
Alex has a stellar record and I strongly support his promotion.

THE UNIVERSITY OF TEXAS
Cockrell School of Engineering
Standard Resume

FULL NAME: Alexandros G. Dimakis **TITLE:** Asst. Professor
DEPARTMENT: Electrical and Computer Engineering

EDUCATION:

Univ. of California, Berkeley	Electrical and Computer	Ph.D.	Aug. 2008
Univ. of California, Berkeley	Electrical and Computer	M.S.	May 2005
National Technical Univ. of Athens	Electrical and Computer	Diploma	June 2003

PROFESSIONAL REGISTRATION: None

CURRENT AND PREVIOUS ACADEMIC POSITIONS:

University of Texas at Austin	Asst. Professor	Jan. 2013 – present
Univ. of Southern California	Asst. Professor	May 2009 – Dec. 2012
California Inst. of Technology	Postdoctoral Scholar	Sept. 2008 – May 2009
Univ. of California, Berkeley	Research Assistant	Aug. 2003 – Aug. 2009

OTHER PROFESSIONAL EXPERIENCE:

Microsoft Research	Summer Research Intern	June 2006 – Aug. 2006
Ecole Polytechnique Federale de Lausanne (EPFL)	Summer Research Intern	June 2005 – Aug. 2005

HONORS AND AWARDS:

1. **ARO Young Investigator Award** for research on learning network properties through low rank approximations, June 2014
2. **Keynote speaker**, Workshop on Big Dynamic Distributed Data (BD3) (in conjunction with VLDB 2013)
3. **Google Faculty Research Award** for research on coding for big data, 2012
4. Joint IEEE Information Theory and Communications Society Best Paper Award, 2012
5. **NSF CAREER** Award for research on information theory and distributed storage, January 2012
6. IEEE Data Storage Technical Committee (DSTC), 2010 Best Paper Award on Data Storage
7. **Keynote speaker**, 2010 IEEE Int. Symposium on Network Coding (NetCod)
8. UC Berkeley 2008 Eli Jury Dissertation Award for outstanding achievement in the area of Systems, Communications, Control, or Signal Processing
9. Best Paper award in IEEE/ACM Symposium on Information Processing in Sensor Networks (IPSN '05)

UNIVERSITY COMMITTEE ASSIGNMENTS:

Member, Semester Course Evaluation	2014
Member, Prequalifier Screening Committee	2014
Organizer, WNCG Seminars	2014
Poster judge, Exhibition and Eng. Research (PEERS)	2014
Member, Graduate Admissions for CommNetS	2013 – 2014
Winedale Program Chair	2013

PROFESSIONAL SOCIETY AND MAJOR GOVERNMENTAL COMMITTEES:

Federal Funding Agency Review Panels

1. NSF CCF Panel, April 2010.

International Funding Agency Reviews

1. External Proposal Referee, Israel Science Foundation (ISF), 2011.
2. External Proposal Referee, Greece Science Foundation, Thales Research Program, 2011.
3. External Proposal Referee, Research Grants Council (RGC) of Hong Kong, 2014.

Conference Program Committees

1. Technical Program Committee Member, IEEE International Symposium on Information Theory (ISIT), June 29-July 4, 2014.
2. Technical Program Committee Member, ACM MOBIHOC, July 29 – Aug. 1, 2013.
3. Technical Program Committee Member, IEEE International Symposium on Information Theory (ISIT), July 7-12, 2013.
4. Publicity Chair, IEEE International Symposium on Network Coding (NetCod), June 7-9, 2013.
5. Technical Program Committee Member, IEEE INFOCOM, April 14-19, 2013.
6. Workshop Chair, IEEE Consumer Communications and Networking Conference (CCNC), Jan. 11-14, 2013.
7. Technical Program Committee Member, IEEE International Symposium on Information Theory (ISIT), July 1-6, 2012.
8. Technical Program Committee Member, IEEE International Symposium on Network Coding (NetCod), June 29-30, 2012
9. Technical Program Committee Member, ACM MOBIHOC, June 11-14, 2012.
10. Technical Program Committee Member, IEEE INFOCOM, March 25-30, 2012.
11. Symposium Co-Chair, IEEE Globecom 2011, Selected Areas in Communications Symposium, Data Storage Track. Dec. 5-9, 2011.
12. Technical Program Committee Member, IEEE International Symposium on Network Coding (NetCod), June 29-30, 2011.
13. Technical Program Committee Member, International Conference on Distributed Computing in Sensor Systems (DCOSS), June 21-23, 2010.
14. Technical Program Committee Member, IEEE International Symposium on Network Coding (NetCod), June 9-11, 2010.
15. Technical Program Committee Member, International Conference on Distributed Computing in Sensor Systems (DCOSS), June 8-10, 2009.

Conference Organizational Activities

1. Session organizer for ITA Workshops in 2013, 2014.
2. Organizer of the Winedale Workshop, Oct. 15, 2013.
3. Session Organizer at Allerton 2013, Session title: “Coding Theory and Distributed Storage," Sept. 26-28, 2013.
4. Session organizer at Asilomar 2011, Session title: “Distributed Storage,” Nov. 6-9, 2011.

Review and Editorial Service

1. Reviewer for multiple journal and conferences including PNAS, PLOS ONE, IEEE Transactions on Information Theory, Transactions on Networking, Random Structures and Algorithms and top conferences (STOC, SODA, Infocom, Mobicom).
2. Associate editor for IEEE Signal Processing letters (SPL) since Jan. 2012.

PUBLICATIONS:

A. Refereed Archival Journal Publications

J29 D. Papailiopoulos and A.G. Dimakis, "Locally Repairable Codes," accepted to IEEE Transactions on Information Theory.

J28 N. Golrezaei, A.G. Dimakis, and A.F. Molisch, "Scaling Behaviors of Wireless Device-to-Device Communications with Distributed Caching," vol. 60(7), pp. 4256-4298, July 2014.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6805204

J27 N. Golrezaei, P. Mansourifard, A.F. Molisch, and A.G. Dimakis, "Base-Station Assisted Device-to-Device Communications for High-Throughput Wireless Video Networks," vol. 13(7), pp.3665-3676, July 2014.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6787081

J26 K. Shanmugam, D.S. Papailiopoulos, A.G. Dimakis, and G. Caire, "A Repair Framework for Scalar MDS Codes," IEEE Journal on Selected Areas in Communications, vol. 32(5), pp. 998-1007, May 2014.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6804944

J25 A. Megasthenis and A.G. Dimakis, "Repairable Fountain Codes," IEEE Journal on Selected Areas in Communications, vol. 32(5), pp. 1037-1047, May 2014.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6804947

J24 T.K. Dikaliotis, A.G. Dimakis, T. Ho, and M. Effros, "On the Delay Advantage of Coding in Packet Erasure Networks," IEEE Transactions on Information Theory, vol. 60 (5), pp. 2868-2883. May 2014.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6776539

J23 K. Shanmugam, N. Golrezaei, A.G. Dimakis, A.F. Molisch, and G. Caire, "FemtoCaching: Wireless Content Delivery through Distributed Caching Helpers," IEEE Transactions on Information Theory, vol. 59(12), pp. 8402-8413, Dec. 2013.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6600983

J22 M. Sathiamoorthy, A. Dimakis, B. Krishnamachari and F. Bai, "Distributed Storage Codes Reduce Latency in Vehicular Networks," IEEE Transactions on Mobile Computing, vol. 13(9), pp. 2016-2027, June 2013.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=6541941

J21 D. S. Papailiopoulos, A.G. Dimakis, and V.R. Cadambe, "Repair Optimal Erasure Codes through Hadamard Designs," IEEE Transactions on Information Theory, vol. 59(5), pp. 3021-3037, May 2013.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6416066

J20 N. Golrezaei, A.F. Molisch, A.G. Dimakis, and G. Caire, "Femtocaching and Device-to-Device Collaboration: A New Architecture for Wireless Video Distribution," IEEE Communications Magazine, vol. 51(4), pp. 142-149, April 2013.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6495773

J19 M. Sathiamoorthy, M. Asteris, D. Papailiopoulos, A.G. Dimakis, R. Vadali, S. Chen, and D. Borthakur, "XORing Elephants: Novel Erasure Codes for Big Data," Proceedings of the VLDB Endowment, vol. 6(5), pp. 325-336, March 2013.
http://dl.acm.org/citation.cfm?id=2488339

J18 A. Khajehnejad, A.G. Dimakis, B. Hassibi, B. Vigoda, and W. Bradley, "Reweighted LP Decoding for LDPC Codes," IEEE Transactions on Information Theory, vol. 58(9), pp. 5972-5984, Sept. 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6210385

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B. Refereed Conference Proceedings

C60 M. Asteris, A.G. Dimakis, and D.S. Papailiopoulos, "Nonnegative Sparse PCA with Provable Guarantees," International Conference on Machine Learning (ICML), 2014. (to appear)

C59 D.S. Papailiopoulos, I. Mitliagkas, A.G. Dimakis, and C. Caramanis, "Finding Dense Subgraphs via Low-Rank Bilinear Optimization," International Conference on Machine Learning (ICML), 2014. (to appear)

C58 K. Shanmugam and A.G. Dimakis, "Bounding Multiple Unicasts through Index Coding and Locally Repairable Codes," IEEE International Symposium on Information Theory (ISIT 2014). (to appear)

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C9 J. Schiff, D. Antonelli, A.G. Dimakis, D. Chu, and M.J. Wainwright, "Robust Message-Passing for Statistical Inference in Sensor Networks," 6th International Symposium ACM/IEEE Symposium on Information Processing in Sensor Networks (IPSN), pp. 109-118, Cambridge, MA, April 2007.
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C4 A.G. Dimakis, V. Prabhakaran, and K. Ramchandran, "Ubiquitous Access to Distributed Data in Large-Scale Sensor Networks through Decentralized Erasure Codes," 4th International

Symposium on Information Processing in Sensor Networks (IPSN), pp. 111-117, Los Angeles, CA, April 2005.
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C1 P. Maragos, A.G. Dimakis, and I. Kokkinos, "Some Advances in Nonlinear Speech Modeling using Modulations, Fractals and Chaos," 14th International Conference on Digital Signal Processing (DSP), vol. 1, pp. 325-332, Santorini, Greece, July 2002.
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ORAL PRESENTATIONS:
(invited talks not including conference paper presentations)

1. "Distributed Information Processing in Sensor Networks," University of Southern California, May 2006.
2. "Regenerating Codes for Distributed Storage," University of Southern California, Nov. 2007.
3. "Regenerating Codes for Distributed Storage," Texas A&M University, Computer Engineering Seminar, Nov. 2007.
4. "Gossip Algorithms for Sensor Networks," University of Texas, Austin, WNCG Seminar, Nov. 2007.
5. "Regenerating Codes for Distributed Storage," Stanford University, WSL Group Seminar, Dec. 2007.
6. "Gossip Along the Way: Order-Optimal Consensus through Randomized Path Averaging," Invited Presentation, SIAM Conference on Optimization, May 2008.
7. "Network Coding for Distributed Storage," Keynote Address, 2010 IEEE International Symposium on Network Coding (NetCod), June 2010.
8. "A Tutorial on Gossip Algorithms," Invited Tutorial, European Conference on Wireless Sensor Networks (EWSN), Coimbra, Portugal, Oct. 2010.
9. "Network Coding for Distributed Storage," 2010 Invited Seminar, ECE Department, University of California, San Diego, Nov. 2010.
10. "Network Coding for Cloud Storage," Research Seminar, Interdisciplinary Centre for Security Reliability and Trust, University of Luxembourg, June 2011.
11. "A Tutorial on Distributed Storage Problems and Regenerating Codes," Invited Tutorial, 2011 IEEE International Symposium on Network Coding (NetCod), July 2011.
12. "Network Coding for Cloud Storage," Invited Tutorial, First Workshop on Network Coding and Data Storage, Beijing, China, July 2011.
13. "Interference Alignment for Network Coding and Distributed Storage," Invited Talk, Algebraic Structure in Network Information Theory, Banff International Research Station, Aug. 2011.
14. "Network Coding for Cloud Storage," Center for Information and Systems Engineering (CISE) Seminar, Boston University, Sept. 2011.
15. "Network Coding for Cloud Storage," Coordinated Science Laboratory (CSL) Seminar, University of Illinois, Urbana-Champaign, Dec. 2011.
16. "Reweighted Compressed Sensing, Mathematical Challenges in Graphical Models and Message-Passing Algorithms," Invited Talk, Institute for Pure and Applied Mathematics (IPAM) Workshop, Jan. 2012.
17. "Network Coding for Cloud Storage," Invited Tutorial, International Conference on Signal Processing and Communications (SPCOM), July 2012.
18. Network Coding for Cloud Storage," Invited School Lecturer, European School of Information Theory, April 2012.

19. "Network Coding for Cloud Storage," Facebook Tech Talk, Jan. 2012.
20. "Network Coding for Cloud Storage," NetApp Presentation, Jan. 2012.
21. "Network Coding for Cloud Storage," Stanford University, Information Systems Laboratory (ISL) Colloquium, Jan. 2012.
22. "Network Coding for Cloud Storage," MIT LIDS Seminar (joint with Theory of Computation Seminar), Dec. 2012
23. "Distributed Storage Codes and Applications," Invited Speaker, Docomo Innovations, Palo Alto, CA, Feb. 2013.
24. "Distributed Storage Codes and Applications," Invited Speaker, Google, Mountain View, CA. Feb. 2013.
25. "Asymptotics of Large-Scale Interacting Networks Workshop," Invited Speaker, Banff International Research Station (BIRS), Canada, March 2013.
26. "An Overview of Network Coding for Cloud Storage," Invited Speaker and Area Chair, NSF-ECCS Workshop "Big Data: From Signal Processing to Systems Engineering," Arlington, VA, March 2013.
27. Invited Tutorial speaker, IEEE Int. Symposium on Information Theory (ISIT) 2013. (3 hour tutorial).
28. "Distributed Storage codes and Applications," Invited Speaker, AT&T Research Labs, New Jersey, Aug. 2013.
29. "Coding for Large-Scale Storage," Keynote Speaker, Workshop on Big Dynamic Distributed Data (in conjunction with VLDB 2013), Aug. 201
30. "Coding for Large-Scale Storage," Invited Speaker, Conference on Algebra, Codes and Networks, Bordeaux, France, June 2014.

GRANTS AND CONTRACTS:

Co-Investigators	Title	Agency	Grant Total	Grant Period
Krishnamachari (USC) (Dimakis Co-PI)	Efficient Storage in Vehicular Networks, (Research contract with USC)	General Motors	$ 98,000 ($ 39,000)	09/2010-9/2011
(none) (Dimakis PI)	CAREER: Network Coding Theory for Distributed Storage	National Science Foundation (NSF)	$ 470,000 ($ 470,000)	2/2011-1/2016
Caire, Molisch (USC) (Dimakis Co-PI)	D2D Wireless Video: Breaking the Cellular Capacity Bottleneck for Efficient Video Delivery	Intel and Cisco	$ 300,000 ($ 100,000)	1/2011-1/2014
Krishnamachari (USC) (Dimakis Co-PI)	Cloud Content Management in Vehicular Networks, (Research contract with USC)	General Motors	$ 100,000 ($ 50,000)	10/2011-9/2012
Ramchandran (UC Berkeley) (Dimakis PI)	Workshop Proposal: Communication Theory and Signal Processing in the Cloud Era	National Science Foundation (NSF)	$ 39,279 ($ 19,500)	06/2012

(none) (Dimakis PI)	Coding for Big Data	Google Faculty Research Award	$ 60,000 ($ 60,000)	7/2012
Pfister (Texas A&M, PI) (Dimakis, UT, PI)	CIF: Small: Collaborative Research: Design and Analysis of Novel Compressed Sensing Algorithms via Connections with Coding Theory	National Science Foundation (NSF)	$ 470,000 ($ 217,000)	9/2012- 8/2015
joint with Continuum Analytics (Dimakis PI)	Data-Parallel Analytics on Graphics Processing Units (GPUs)	DARPA STTR Grant	$ 100,000 ($ 30,000)	06/2014 - 11/2014
Viswanath (UIUC, Lead PI), Ramchandran (UC Berkeley, PI) Muriel Medard (MIT, PI) Hajek (UIUC, Co-PI) Srikant (UIUC, Co-PI) (Dimakis, UT, PI)	CIF: Medium: Collaborative Research: Content Delivery over Heterogeneous Networks: Fundamental Limits and Distributed Algorithms	National Science Foundation (NSF)	$ 1,200,000 ($ 200,000)	8/2014 - 8/2017
(none) (Dimakis PI)	YIP: Learning Network Properties through Low Rank Approximations	Army Research Office (ARO)	$ 150,000 ($ 150,000)	09/2014 - 08/2017
(none) (Dimakis PI)	CIF: Small: Sparsity in Quadratic Optimization through Low-Rank Approximations	National Science Foundation (NSF)	$ 425,000 ($ 425,000)	09/01/2014 - 08/31/2017
(none)	WNCG Affiliates Program + Small research gifts	Several industrial affiliates	$ 32,000 ($ 32,000)	2009-2013
		Total	$3,444,279	
		My Share	($1,792,500)	

PH.D. SUPERVISIONS COMPLETED:

Dimitris Papailiopoulos	Distributed Large-scale Data Storage and Processing	2014	Electrical and Computer Engineering	Univ. of Texas at Austin
Maheswaran Sathiamoorthy (co-supervised with B. Krishnamachari, USC)	Optimizing Distributed Storage in Cloud Environments	2013	Electrical Engineering	Univ. of Southern California

Terminal M.S. SUPERVISIONS COMPLETED:

- Samer Chucri
  (2012-2013) Graduated from UT Austin. Joined Google.
- Negin Golrezaei
  (2011-2013) Graduated from USC. Joined USC Business School PhD Program.
- Sarabjot Khangura
  (2011-2012) Graduated from USC. Joined Startup.
- Yi-Hsuan (Griffey) Kao
  (2011-2012) Graduated from USC. Joined USC PhD Program.

PH.D. IN PROGRESS:

A. Students admitted to candidacy

B. Post M.S. students preparing to take Ph.D. qualifying exam

Erik Lindgren – Joining UT in Fall 2014.
Shanshan Wu (co-advised with S. Sanghavi) – Joining UT in Fall 2014.
Ethan Elenberg (2012-) (joint with S. Vishwanath)
Murat Kocaoglu (2013-) (joint with S. Vishwanath)
Karthikeyan Shanmugam (2011-)
Megasthenis Asteris (2011-)

M.S. IN PROGRESS:

VITA:

Alex Dimakis is an Assistant Professor in the Electrical and Computer Engineering Department, University of Texas at Austin. From 2009 until 2012 he was with the Viterbi School of Engineering, University of Southern California. He received his Ph.D. in 2008 and M.S. degree in 2005 in Electrical Engineering and Computer Sciences from UC Berkeley and the Diploma degree from the National Technical University of Athens in 2003. During 2009 he was a CMI postdoctoral scholar at Caltech.

He received an NSF Career Award in 2011, a Google Faculty Research Award in 2012 and the Eli Jury Dissertation Award in 2008. He is the co-recipient of several best paper awards including the joint Information Theory and Communications Society Best Paper Award in 2012. He is currently serving as an associate editor for IEEE Signal Processing Letters.

His research interests include information theory, coding theory, machine learning, and networking.

Co-Authored Works

Alex Dimakis
Department of Electrical and Computer Engineering, The University of Texas at Austin
dimakis@austin.utexas.edu

This document identifies co-authors and percentage contributions to each journal paper published in rank. Percentages refer only to group leaders. The contributions of students and postdocs are combined with that of their group leader. Names of group leaders are indicated in bold in the author list. In this document I focus on peer-reviewed journal contributions only, as conference publications do not necessarily add original information for the promotion process. The culture of my research area is that major research advances are published in journal articles, while conference proceedings typically report the same research results but in a preliminary state.

Collaborators (in rank)

Current/Former Students and Postdocs in my group

- M. Asteris (UT Austin, TX)
- N. Golrezaei (USC, CA)
- D. Papailiopoulos (UT Austin, TX)
- M. Sathiamoorthy (USC, CA)
- K. Shanmugam (UT Austin, TX)
- A.S. Tehrani (USC, CA)

Students, postdocs, junior staff scientists not in my group (affiliations shown at the time of co-authorship)

- F. Benezit (EPFL, Lausanne, Switzerland)
- S. Chen (junior Facebook engineer, CA)
- T.K. Dikaliotis (Caltech, CA)
- P.B. Godfrey (UC Berkeley, CA)
- A.A. Gohari (UC Berkeley, CA)
- S. Kar (Carnegie Mellon University, PA)
- A. Khajehnejad (Caltech, CA)
- D. Leong (Caltech, CA)
- P. Mansourifard (USC, CA)
- B. Nazer (University of Wisconsin-Madison, WI)
- C. Suh (UC Berkeley, CA)
- R. Vadali (junior Facebook engineer, CA)
- W. Xu (Caltech, CA)

Faculty Colleagues (affiliations shown at the time of co-authorship)

- G. Caire (USC, CA)
- B. Krishnamachari (USC, CA)
- A.F. Molisch (USC, CA)
- M.J. Neely (USC, CA)

External Senior Collaborators (affiliations shown at the time of co-authorship)

- F. Bai (General Motors, MI)
- D. Borthakur (senior Facebook engineer)
- W. Bradley (senior engineer Lyric Semiconductors)
- V.R. Cadambe (MIT, MA)
- C. Daskalakis (MIT, MA)
- M. Effros (Caltech, CA)
- M. Gastpar (EPFL, Lausanne, Switzerland)
- B. Hassibi (Caltech, CA)
- T. Ho (Caltech, CA)
- E. Mossel (UC Berkeley, CA)
- J.M.F. Moura (Carnegie Mellon University, PA)
- M.G. Rabbat (McGill University, Canada)
- D. Sarwate (UC San Diego, CA)
- A. Scaglione (UC Davis, CA)
- R. Smarandache (University of Notre Dame)
- P. Thiran (EPFL, Lausanne, Switzerland)
- M. Vetterli (EPFL, Lausanne, Switzerland)
- B. Vigoda (senior engineer Lyric Semiconductors)
- P.O. Vontobel (HP Labs, CA)
- Y. Wu (Microsoft Research, WA)

Advisors

- K. Ramchandran (UC Berkeley, CA)
- M.J. Wainwright (UC Berkeley, CA)

List of Journal Papers Published in Rank and Percentage Contributions

J25 D. Papailiopoulos and **A.G. Dimakis**, "Locally Repairable Codes," accepted to IEEE Transactions on Information Theory. **[AGD 100%]**

J24 N. Golrezaei, **A.G. Dimakis**, and **A.F. Molisch**, "Scaling Behaviors of Wireless Device-to-Device Communications with Distributed Caching," IEEE Transactions on Information Theory, vol. 60(7), pp. 4286-4298, July 2014. **[AGD 70%, AFM 30%]**

J23 N. Golrezaei, P. Mansourifard, **A.F. Molisch**, and **A.G. Dimakis**, "Base-Station Assisted Device-to-Device Communications for High-Throughput Wireless Video Networks," IEEE Transactions on Wireless Communications, vol. 13(7), pp. 3665-3676, July 2014. **[AGD 50%, AFM 50%]**

J22 K. Shanmugam, D.S. Papailiopoulos, **A.G. Dimakis**, and **G. Caire**, "A Repair Framework for Scalar MDS Codes," IEEE Journal on Selected Areas in Communications, vol. 32(5), pp. 998-1007, May 2014. **[AGD 90%, GC 10%]**

J21 M. Asteris and **A.G. Dimakis**, "Repairable Fountain Codes," IEEE Journal on Selected Areas in Communications, vol. 32(5), pp. 1037-1047, May 2014. **[AGD 100%]**

J20 T.K. Dikaliotis, **A.G. Dimakis**, **T. Ho**, and **M. Effros**, "On the Delay Advantage of Coding in Packet Erasure Networks," IEEE Transactions on Information Theory, vol. 60 (5), pp. 2868-2883. May 2014. **[AGD 50%, TH 40%, ME 10%]**

J19 K. Shanmugam, N. Golrezaei, **A.G. Dimakis**, **A.F. Molisch**, and **G. Caire**, "FemtoCaching: Wireless Content Delivery through Distributed Caching Helpers," IEEE Transactions on Information Theory, vol. 59(12), pp. 8402-8413, Dec. 2013. **[AGD 70%, AFM 10%, GC 20%]**

J18 M. Sathiamoorthy, **A.G. Dimakis**, **B. Krishnamachari** and **F. Bai**, "Distributed Storage Codes Reduce Latency in Vehicular Networks," IEEE Transactions on Mobile Computing, Issue 99, pp. 1-12, June 2013. **[AGD 60%, BK 30%, FB 10%]**

J17 D. S. Papailiopoulos, **A.G. Dimakis**, and **V.R. Cadambe**, "Repair Optimal Erasure Codes through Hadamard Designs," IEEE Transactions on Information Theory, vol. 59(5), pp. 3021-3037, May 2013. **[AGD 50%, VRC 50%]**

N. Golrezaei, **A.F. Molisch**, **A.G. Dimakis**, and **G. Caire**, "Femtocaching and Device-to-Device Collaboration: A New Architecture for Wireless Video Distribution," IEEE Communications Magazine, vol. 51(4), pp. 142-149, April 2013.

J16 **[AGD 40%, AFM 40%, GC 20%]**

M. Sathiamoorthy, M. Asteris, D. Papailiopoulos, **A.G. Dimakis**, R. Vadali, S. Chen, and **D. Borthakur**, "XORing Elephants: Novel Erasure Codes for Big Data," Proceedings of the VLDB Endowment, vol. 6(5), pp. 325-336, March 2013.

J15 **[AGD 90%, DB 10%]**

A. Khajehnejad, **A.G. Dimakis**, **B. Hassibi**, **B. Vigoda**, and **W. Bradley**, "Reweighted LP Decoding for LDPC Codes," IEEE Transactions on Information Theory, vol. 58(9), pp. 5972-5984, Sept. 2012. **[AGD 50%, BH 40%, BV 5%, WB 5%]**

J14

D.S. Papailiopoulos and **A.G. Dimakis**, "Interference Alignment as a Rank Constrained Rank Minimization," IEEE Transactions on Signal Processing, vol. 60(8), pp. 4278-4288, Aug. 2012. **[AGD 100%]**

J13

D. Leong, **A.G. Dimakis**, and **T. Ho**, "Distributed Storage Allocations," IEEE Transactions on Information Theory, vol. 58(7), pp. 4733-4752, July 2012. **[AGD 70%, TH 30%]**

J12

A.G. Dimakis, **R. Smarandache**, and **P.O. Vontobel**, "LDPC Codes for Compressed Sensing," IEEE Transactions on Information Theory, vol. 58(5), pp. 3093-3114, May 2012. **[AGD 50%, RS 5%, POV 45%]**

J11

A.D. Sarwate and **A.G. Dimakis**, "The Impact of Mobility on Gossip Algorithms," IEEE Transactions on Information Theory, vol. 58(3), pp. 1731-1742, March 2012. **[AGD 50%, ADS 50%]**

J10

A.S. Tehrani, **A.G. Dimakis**, and **M.J. Neely**, "SigSag: Iterative Detection through Soft Message-Passing," IEEE Journal of Selected Topics in Signal Processing, vol. 5(8), pp. 1512-1523, Dec. 2011. **[AGD 50%, MJN 50%]**

J9

B. Nazer, **A.G. Dimakis**, and **M. Gastpar**, "Local Interference can Accelerate Gossip Algorithms," IEEE Journal of Selected Topics in Signal Processing, Special Issue on Gossiping Algorithms Design and Application, vol. 5(4), pp. 876-887, Aug. 2011. **[AGD 70%, MG 30%]**

J8

C. Daskalakis, **A.G. Dimakis**, and **E. Mossel**, "Connectivity and Equilibrium in Random Games," Annals of Applied Probability, vol. 21(3), pp. 987-1016, June 2011. **[AGD 33.3%, CD 33.3%, EM 33.3%]**

J7

A.G. Dimakis, **K. Ramchandran**, **Y. Wu**, and C. Suh, "A Survey on Network Codes for Distributed Storage," Proceedings of the IEEE, vol. 99(3), pp. 476-489, March 2011. **[AGD 80%, KR 10%, YW 10%]**

J6

M.A. Khajehnejad, **A.G. Dimakis**, W. Xu, and **B. Hassibi**, "Sparse Recovery of Nonnegative Signals with Minimal Expansion," IEEE Transactions on Signal Processing, vol. 59(1), pp. 196-208, Jan. 2011. **[AGD 50%, BH 50%]**

J5

A.G. Dimakis, S. Kar, **J.M.F. Moura**, **M.G. Rabbat**, and **A. Scaglione**, "Gossip Algorithms for Distributed Signal Processing," Proceedings of the IEEE, vol. 98(11), pp. 1847-1864, Nov. 2010.

J4 **[AGD 40%, JMFM 10%, MGR 40%, AS 10%]**

F. Benezit, **A.G. Dimakis**, **P. Thiran**, and **M. Vetterli**, "Order-Optimal Consensus through Randomized Path Averaging," IEEE Transactions on Information Theory, vol. 56(10), pp. 5150-5167, Oct. 2010.

J3 **[AGD 70%, PT 20% MV 10%]**

A.G. Dimakis, P.B. Godfrey, **Y. Wu**, **M.J. Wainwright**, and **K. Ramchandran**, "Network Coding for Distributed Storage Systems," IEEE Transactions on Information Theory, vol. 56(9), pp. 4539-4551 Sept. 2010.

J2 **[AGD 80%, YW 10%, MJW 5% KR 5%]**

A.G. Dimakis, A.A. Gohari, and **M. Wainwright**, "Guessing Facets: Polytope Structure and Improved LP Decoder," IEEE Transactions on Information Theory, vol. 55(8), pp. 3479-3487 Aug. 2009. **[AGD 70%, MJW 30%]**

J1

Forthcoming Works

Alex Dimakis
Department of Electrical and Computer Engineering, The University of Texas at Austin
dimakis@austin.utexas.edu

In the following, papers that have been accepted but not yet published are listed. Paper indices refer back to the full publication list in my CV. Copies of acceptance letters are attached.

A. Refereed Archival Journal Publications

J29 D. Papailiopoulos and A.G. Dimakis, "Locally Repairable Codes," accepted to IEEE Transactions on Information Theory.

B. Refereed Conference Proceedings

C60 M. Asteris, A.G. Dimakis, and D.S. Papailiopoulos, "Nonnegative Sparse PCA with Provable Guarantees," International Conference on Machine Learning (ICML), 2014. (to appear)

C59 D.S. Papailiopoulos, I. Mitliagkas, A.G. Dimakis, and C. Caramanis, "Finding Dense Subgraphs via Low-Rank Bilinear Optimization," International Conference on Machine Learning (ICML), 2014. (to appear)

C58 K. Shanmugam and A.G. Dimakis, "Bounding Multiple Unicasts through Index Coding and Locally Repairable Codes," IEEE International Symposium on Information Theory (ISIT 2014). (to appear)

C57 A.S. Rawat, D.S. Papailiopoulos, A.G. Dimakis, and S. Vishwanath, "Locality and Availability in Distributed Storage," IEEE International Symposium on Information Theory (ISIT 2014). (to appear)

C56 K. Shanmugam, A.G. Dimakis, and M. Langberg, "Graph Theory versus Minimum Rank for Index Coding," IEEE International Symposium on Information Theory (ISIT 2014). (to appear)

From: <milenkov@uiuc.edu>
Subject: IEEE Transactions on Information Theory - Decision on Manuscript ID IT-13-0234.R2
Date: April 10, 2014 8:11:17 PM CDT
To: <dimitris@utexas.edu>, <papailiopoulos@gmail.com>
Cc: <dimitris@utexas.edu>, <papailiopoulos@gmail.com>, <dimakis@austin.utexas.edu>

April 21st, 2014

Dear Mr. Papailiopoulos:

It is a pleasure to inform you that your manuscript titled "Locally Repairable Codes" was accepted for publication in the IEEE Transactions on Information Theory in its present form. Additional comments of the reviewer(s), if any, are included at the foot of this letter. There may be additional comments from the reviewers as separate files available through your Author Center on the ScholarOne Manuscripts web site, so please check there also to make sure you have received all reviewer comments.

Please submit all final files through the "awaiting final files" queue in your Author Center on ScholarOne Manuscripts. Please make sure your final package is complete upon submission. Once you have completed the submission of your final files you will not be able to go back and make changes. You may upload your final submission files in a single zip package.

Please do not send ANY items via email, regular mail, or fax, as they will not be processed if you do

In addition to uploading your files, please check that the author-supplied data, such as contact and co-author information in step 3 of the final submission process, is correct and complete. Failure to enter complete author and co-author information in the designated area on ScholarOne Manuscripts may result in publishing delays.

Thank you very much for your contribution.

Sincerely,

Prof. Olgica Milenkovic
Associate Editor, IEEE Transactions on Information Theory
milenkov@uiuc.edu

From: Eric Xing <epxing@cs.cmu.edu>
Subject: ICML 2014: Decision on Paper#: 1232
Date: April 12, 2014 2:47:35 PM CDT
To: <dimakis@austin.utexas.edu>
Cc: <program@icml.cc>
Reply-To: <program@icml.cc>

Dear Alexandros Dimakis,

We are pleased to inform you that your submission to ICML 2014,

Paper#: 1232 - Nonnegative Sparse PCA with Provable Guarantees

was accepted for publication. Congratulations! You can access the reviews by logging into the conference management system at:

https://cmt.research.microsoft.com/ICML2014/Default.aspx

Each submitted paper has received at least three reviewers and a meta review. And all the reviews and the manuscripts themselves were carefully evaluated by the SPC and/or Program Chairs. Of 661 complete

submissions in Cycle 2, 148 were accepted. An additional 77 papers were accepted from invited resubmission from Cycle 1. Overall, 310 papers were accepted from a total of 1238 submissions from both cycles, a record high for ICML. The acceptance criteria for both cycles were calibrated and therefore uniform across cycles.
All accepted papers will get poster presentations at the conference and most if not all of them will also get an oral presentation of a certain form. These later decisions will be made in May 2014.
The camera-ready version of your paper is due by May 12, 2014; you will soon receive further instructions about the specific process. In the meantime, please follow the suggestions of the reviewers while preparing your final draft, and make sure to use the style files available at icml.cc.
We look forward to seeing you in Beijing! A provisional schedule will be available in a few weeks on http://icml.cc/2014.

Sincerely,

Eric Xing and Tony Jebara
ICML 2014 Program Chairs
program@icml.cc

From: Eric Xing <epxing@cs.cmu.edu>
Subject: ICML 2014: Decision on Paper#: 1296
Date: April 12, 2014 2:47:36 PM CDT
To: <dimakis@austin.utexas.edu>
Cc: <program@icml.cc>
Reply-To: <program@icml.cc>

Dear Alexandros Dimakis,

We are pleased to inform you that your submission to ICML 2014,

Paper#: 1296 - Finding Dense Subgraphs via Low-Rank Bilinear Optimization

was accepted for publication. Congratulations! You can access the reviews by logging into the conference management system at:

https://cmt.research.microsoft.com/ICML2014/Default.aspx

Each submitted paper has received at least three reviewers and a meta review. And all the reviews and the manuscripts themselves were carefully evaluated by the SPC and/or Program Chairs. Of 661 complete submissions in Cycle 2, 148 were accepted. An additional 77 papers were accepted from invited resubmission from Cycle 1. Overall, 310 papers were accepted from a total of 1238 submissions from both cycles, a record high for ICML. The acceptance criteria for both cycles were calibrated and therefore uniform across cycles.
All accepted papers will get poster presentations at the conference and most if not all of them will also get an oral presentation of a certain form. These later decisions will be made in May 2014.
The camera-ready version of your paper is due by May 12, 2014; you will soon receive further instructions about the specific process. In the meantime, please follow the suggestions of the reviewers while preparing your final draft, and make sure to use the style files available at icml.cc.
We look forward to seeing you in Beijing! A provisional schedule will be available in a few weeks on http://icml.cc/2014.

Sincerely,

Eric Xing and Tony Jebara
ICML 2014 Program Chairs
program@icml.cc

From: ISIT'2014 <isit2014-chairs@edas.info>
Subject: [ISIT'2014] Your paper #1569898467 ('Bounding Multiple Unicasts through Index Coding and Locally Repairable Codes') has been accepted
Date: March 29, 2014 6:36:38 PM CDT
To: Karthikeyan Shanmugam <karthiksh@utexas.edu>
Cc: Alexandros Dimakis <dimakis@austin.utexas.edu>

Dear Mr. Shanmugam,

We are happy to inform you that your paper

#1569898467: 'Bounding Multiple Unicasts through Index Coding and Locally Repairable Codes'

submitted to the 2014 IEEE International Symposium on Information Theory,
has been accepted for presentation at the symposium and for publication in the proceedings. The reviews are attached below and can be found at

http://edas.info/showPaper.php?m=1569898467

We ask you to incorporate the comments of the reviewers in preparing the final manuscript. Please also have a close look at the following instructions:

1. The deadline for uploading the final manuscripts is April 27, 2014, at 11:59pm EDT (New York time zone). This deadline is strict and will not be extended. Shortly after the deadline, uploads will no longer be possible on EDAS. Please also note that every paper must have at least one author registered by April 27. (See below for registration instructions.)
2. You are encouraged to use LaTeX to format your final manuscript, using the standard IEEE style. Please use fonts no smaller than 10 points. For more information, see the instructions posted at http://isit2014.org (The instructions will be posted in early April.)
3. Remember to NOT include a sentence at the beginning of the abstract saying that the paper is to be considered for an IEEE Jack Keil Wolf ISIT Student Paper Award (i.e., if you had this sentence in the initial submission, please remove it both in the PDF of your final paper and also in the abstract stored in EDAS).
4. Please upload the final version on EDAS. Clicking on the link
   http://edas.info/uploadPaper.php?m=1569898467
   should take you to the upload page for this paper.
5. By the upload deadline, an IEEE Copyright form must be provided for each accepted paper. The form should be filled out electronically via the link that EDAS provides during the upload.

In addition to the above, two more conditions need to be satisfied in order for your paper to be included in the ISIT'2014 Proceedings published on IEEE Xplore:

a. Every paper must have a registered author to appear
in the Proceedings. Up to 4 papers may be covered
by a single registration (student registration is OK).
Please register through the ISIT'2014 website at:

http://www.isit2014.org

(The registration page will be live in early April.)
The registration page will ask you for up to 4 paper
numbers. Please enter '1569898467' as one of them.
This must also be done by April 27. Please note that if
you are an IEEE member but not an IT Society member,
you can save more than the registration cost difference
by joining the IT Society (ieee.org/join) before registering.

b. Every paper must be presented at ISIT by one of its
authors. A paper with no presenter will be removed
from IEEE Xplore, unless there are extenuating
circumstances that need to be explained to the
General Chairs and approved by them.

Please note that if you require an invitation letter for a visa,
you should enter your passport number during registration.
After registering, you will receive an email with further
instructions for obtaining an electronic letter in PDF format.
You may also request a paper copy during the registration
process.

Thank you again for your contribution to ISIT. We look
forward to seeing you in Honolulu!

Sincerely,

Sae-Young Chung
Gerhard Kramer
Olgica Milenkovic
Urbashi Mitra

From: ISIT'2014 <isit2014-chairs@edas.info>
Subject: [ISIT'2014] Your paper #1569898185 ('Locality and Availability in Distributed Storage') has been accepted
Date: March 29, 2014 6:36:01 PM CDT
To: Ankit Singh Rawat <ankitsr@mail.utexas.edu>
Cc: Dimitris Papailiopoulos <dimitris@utexas.edu>, Alexandros Dimakis <dimakis@austin.utexas.edu>, Sriram Vishwanath <sriram@austin.utexas.edu>

Dear Mr. Rawat,

We are happy to inform you that your paper

#1569898185: 'Locality and Availability in Distributed Storage'

submitted to the 2014 IEEE International Symposium on Information
Theory,

has been accepted for presentation at the symposium and for publication in the proceedings. The reviews are attached below and can be found at

http://edas.info/showPaper.php?m=1569898185

We ask you to incorporate the comments of the reviewers in preparing the final manuscript. Please also have a close look at the following instructions:

1. The deadline for uploading the final manuscripts is April 27, 2014, at 11:59pm EDT (New York time zone). This deadline is strict and will not be extended. Shortly after the deadline, uploads will no longer be possible on EDAS. Please also note that every paper must have at least one author registered by April 27. (See below for registration instructions.)
2. You are encouraged to use LaTeX to format your final manuscript, using the standard IEEE style. Please use fonts no smaller than 10 points. For more information, see the instructions posted at http://isit2014.org (The instructions will be posted in early April.)
3. Remember to NOT include a sentence at the beginning of the abstract saying that the paper is to be considered for an IEEE Jack Keil Wolf ISIT Student Paper Award (i.e., if you had this sentence in the initial submission, please remove it both in the PDF of your final paper and also in the abstract stored in EDAS).

4. Please upload the final version on EDAS. Clicking on the link

   http://edas.info/uploadPaper.php?m=1569898185

   should take you to the upload page for this paper.

5. By the upload deadline, an IEEE Copyright form must be provided for each accepted paper. The form should be filled out electronically via the link that EDAS provides during the upload.

In addition to the above, two more conditions need to be satisfied in order for your paper to be included in the ISIT'2014 Proceedings published on IEEE Xplore:

a. Every paper must have a registered author to appear in the Proceedings. Up to 4 papers may be covered by a single registration (student registration is OK). Please register through the ISIT'2014 website at:

   http://www.isit2014.org

   (The registration page will be live in early April.) The registration page will ask you for up to 4 paper numbers. Please enter '1569898185' as one of them. This must also be done by April 27. Please note that if you are an IEEE member but not an IT Society member,

you can save more than the registration cost difference
by joining the IT Society (ieee.org/join) before registering.

b. Every paper must be presented at ISIT by one of its
authors. A paper with no presenter will be removed
from IEEE Xplore, unless there are extenuating
circumstances that need to be explained to the
General Chairs and approved by them.

Please note that if you require an invitation letter for a visa,
you should enter your passport number during registration.
After registering, you will receive an email with further
instructions for obtaining an electronic letter in PDF format.
You may also request a paper copy during the registration
process.

Thank you again for your contribution to ISIT. We look
forward to seeing you in Honolulu!

Sincerely,

Sae-Young Chung
Gerhard Kramer
Olgica Milenkovic
Urbashi Mitra

ISIT'2014 <isit2014-chairs@edas.info>
Mar 29

to Karthikeyan, Alexandros, Michael
Dear Mr. Shanmugam,

We are happy to inform you that your paper

#1569898329: 'Graph Theory versus Minimum Rank for Index Coding'

submitted to the 2014 IEEE International Symposium on Information
Theory,
has been accepted for presentation at the symposium and
for publication in the proceedings. The reviews are
attached below and can be found at

http://edas.info/showPaper.php?m=1569898329

We ask you to incorporate the comments of the reviewers in
preparing the final manuscript. Please also have a close look
at the following instructions:

1. The deadline for uploading the final manuscripts is
April 27, 2014, at 11:59pm EDT (New York time zone).
This deadline is strict and will not be extended.
Shortly after the deadline, uploads will no longer
be possible on EDAS. Please also note that every paper
must have at least one author registered by April 27.
(See below for registration instructions.)

2. You are encouraged to use LaTeX to format your final manuscript, using the standard IEEE style. Please use fonts no smaller than 10 points. For more information, see the instructions posted at http://isit2014.org (The instructions will be posted in early April.)

3. Remember to NOT include a sentence at the beginning of the abstract saying that the paper is to be considered for an IEEE Jack Keil Wolf ISIT Student Paper Award (i.e., if you had this sentence in the initial submission, please remove it both in the PDF of your final paper and also in the abstract stored in EDAS).

4. Please upload the final version on EDAS. Clicking on the link

   http://edas.info/uploadPaper.php?m=1569898329

   should take you to the upload page for this paper.

5. By the upload deadline, an IEEE Copyright form must be provided for each accepted paper. The form should be filled out electronically via the link that EDAS provides during the upload.

In addition to the above, two more conditions need to be satisfied in order for your paper to be included in the ISIT'2014 Proceedings published on IEEE Xplore:

a. Every paper must have a registered author to appear in the Proceedings. Up to 4 papers may be covered by a single registration (student registration is OK). Please register through the ISIT'2014 website at:

   http://www.isit2014.org

   (The registration page will be live in early April.) The registration page will ask you for up to 4 paper numbers. Please enter '1569898329' as one of them. This must also be done by April 27. Please note that if you are an IEEE member but not an IT Society member, you can save more than the registration cost difference by joining the IT Society (ieee.org/join) before registering.

b. Every paper must be presented at ISIT by one of its authors. A paper with no presenter will be removed from IEEE Xplore, unless there are extenuating circumstances that need to be explained to the General Chairs and approved by them.

Please note that if you require an invitation letter for a visa, you should enter your passport number during registration. After registering, you will receive an email with further instructions for obtaining an electronic letter in PDF format. You may also request a paper copy during the registration

process.

Thank you again for your contribution to ISIT. We look forward to seeing you in Honolulu!

Sincerely,

Sae-Young Chung
Gerhard Kramer
Olgica Milenkovic
Urbashi Mitra

Leaves of Absence Without Pay

Alex Dimakis
Department of Electrical and Computer Engineering, The University of Texas at Austin
dimakis@austin.utexas.edu

No leave without pay taken.

Statistical Summary for "In Rank"
Alex Dimakis

Metric	Value
Peer-reviewed Journal Publications	25
Peer-reviewed Conference Publications	44
Total Citations of all Publications (career)*	3500
h-index (career)*	29
Google Scholar Total Citations of all Publications (career)	3600
Google Scholar h-index (career)	30
Total Research Funding ($)	$3,444,279
Candidate Share Research Funding ($)	$1,792,500
Total Number of Grants/Contracts Received	11
Number of Grants/Contracts Received as PI	8
PhD Students Completed (count 1 if sole advisor, 0.5 if co-advised)	1.5 (1 as sole advisor)
MS Students Completed (count 1 if sole advisor, 0.5 if co-advised)	4 (4 as sole advisor)
PhD Students in Pipeline (as of 09/2014) (count 1 if sole advisor, 0.5 if co-advised)	4.5 (3 as sole advisor)
MS students in Pipeline (as of 09/2014) (count 1 if sole advisor, 0.5 if co-advised)	0
Courses Taught	8
# of Students Taught	241
Average Instructor Evaluation UG	4.37
Average Instructor Evaluation Grad	4.62
Average Course Evaluation UG	3.90
Average Course Evaluation Grad	4.47
Teaching Awards	0
Student Organizations Advised	1 (ACM)
Undergraduates Supervised	5.5 (5 as sole advisor)
Journal Editorial Boards	1
Symposia Organized	1 Symposium co-chair. 15 Technical program committee member.

*Source:
☑ Publish or Perish
☐ ISI Web of Knowledge

SUMMARY OF ACTIVITIES FOR Alexandros G. Dimakis

September 1, 2011 – August 30, 2012

A. Research:

1. Awards and Honors

NSF CAREER Award for research on information theory and distributed storage, January 2012.

2. Invited Addresses and Colloquia

1. "Network Coding for Cloud Storage," Center for Information and Systems Engineering (CISE) Seminar, Boston University, Sept. 2011.
2. "Network Coding for Cloud Storage," Coordinated Science Laboratory (CSL) Seminar, University of Illinois, Urbana-Champaign, Dec. 2011.
3. "Reweighted Compressed Sensing, Mathematical Challenges in Graphical Models and Message-Passing Algorithms," Invited Talk, Institute for Pure and Applied Mathematics (IPAM) Workshop, Jan. 2012.
4. "Network Coding for Cloud Storage," Invited Tutorial, International Conference on Signal Processing and Communications (SPCOM), July 2012.
5. Network Coding for Cloud Storage," Invited School Lecturer, European School of Information Theory, April 2012.
6. "Network Coding for Cloud Storage," Facebook Tech Talk, Jan. 2012.
7. "Network Coding for Cloud Storage," NetApp Presentation, Jan. 2012.
8. "Network Coding for Cloud Storage," Stanford University, Information Systems Laboratory (ISL) Colloquium, Jan. 2012.

3. Publications

(a) Journals and books

Indicate published, accepted for publication, revised or submitted and under review.

Published:

1. D.S. Papailiopoulos and A.G. Dimakis, "Interference Alignment as a Rank Constrained Rank Minimization," IEEE Transactions on Signal Processing, vol. 60(8), pp. 4278-4288, Aug. 2012. http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6193456
2. D. Leong, A.G. Dimakis, and T. Ho, "Distributed Storage Allocations," IEEE Transactions on Information Theory, vol. 58(7), pp. 4733-4752, July 2012. http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6170563
3. A.G. Dimakis, R. Smarandache, and P.O. Vontobel, "LDPC Codes for Compressed Sensing," IEEE Transactions on Information Theory, vol. 58(5), pp. 3093-3114, May 2012. http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6135505
4. A.D. Sarwate and A.G. Dimakis, "The Impact of Mobility on Gossip Algorithms," IEEE Transactions on Information Theory, vol. 58(3), pp. 1731-1742, March 2012. http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6157082
5. A.S. Tehrani, A.G. Dimakis, and M.J. Neely, "SigSag: Iterative Detection through Soft Message-Passing," IEEE Journal of Selected Topics in Signal Processing, vol. 5(8), pp. 1512-1523, Dec. 2011. http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6025245

(b) Refereed Conference Proceedings

1 N. Golrezaei, A.G. Dimakis, and A.F. Molisch, "Wireless Device-to-Device Communications with Distributed Caching," IEEE International Symposium on Information Theory (ISIT), pp. 2781-2785, Cambridge, MA, July 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6284029

2 M. Asteris and A.G. Dimakis, "Repairable Fountain Codes," 2012 IEEE International Symposium on Information Theory (ISIT), pp. 1752-1756, Cambridge, MA, July 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6283579

3 A.S. Tehrani, A.G. Dimakis, and M.J. Neely, "Bipartite Index Coding," 2012 IEEE International Symposium on Information Theory (ISIT), pp. 2246-2250, Cambridge, MA, July 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6283853

4 D.S. Papailiopoulos, C. Suh, and A.G. Dimakis, "Feedback in the K-user Interference Channel," 2012 IEEE International Symposium on Information Theory (ISIT), pp. 3130-3134, Cambridge, MA, July 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6284140

5 V. Ntranos, G. Caire, and A.G. Dimakis, "Allocations for Heterogenous Distributed Storage," 2012 IEEE International Symposium on Information Theory (ISIT), pp. 2761-2765, Cambridge, MA, July 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6284025

6 D.S. Papailiopoulos and A.G. Dimakis, "Locally Repairable Codes," IEEE International Symposium on Information Theory (ISIT 2012), pp. 2771-2775, Cambridge, MA, July 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6284027

7 N. Golrezaei, P. Mansourifard, A.F. Molisch, and A.G. Dimakis, "Base Station Assisted Device-to-Device Communications for High-Throughput Wireless Video Networks," ICC Workshop on Video Delivery Optimization (ICC-ViOpt), pp. 7077-7081, Ottawa, ON, June 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6787081

8 N. Golrezaei, K. Shanmugam, A.G. Dimakis, A.F. Molisch, and G. Caire, "Wireless Video Content Delivery through Coded Distributed Caching," 2012 IEEE International Conference on Communications (ICC), pp. 2467-2472, Ottawa, ON, June 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6364526

9 N. Golrezaei, K. Shanmugam, A.G. Dimakis, A.F. Molisch, and G. Caire, "FemtoCaching: Wireless Video Content Delivery through Distributed Caching Helpers," IEEE Conference on Computer Communications (INFOCOM), pp. 1107-1115, Orlando, FL, March 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6195469

10 D.S. Papailiopoulos, J. Luo, A.G. Dimakis, C. Huang, and J. Li, "Simple Regenerating Codes: Network Coding for Cloud Storage," IEEE Conference on Computer Communications Mini-conference (INFOCOM), pp. 2801-2805, Orlando, FL, March 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6195703

11 M. Sathiamoorthy, A.G. Dimakis, B. Krishnamachari, and F. Bai, "Distributed Storage Codes Reduce Latency in Vehicular Networks," IEEE Conference on Computer Communications Mini-conference. (INFOCOM), pp. 2646-2650, March 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6195671

12 D.S. Papailiopoulos, A.G. Dimakis, and V. Cadambe, "Repair Optimal Erasure Codes through Hadamard Designs," Allerton 2011 49th Annual Allerton Conference on Communication, Control, and Computing (Allerton), pp. 1382-1389, Monticello, IL, Sept. 2011.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6120328

(c) Conference Presentations Without Proceedings of Full Papers
None

3. Student Advising

(a) Completed PhD Theses
Names of students and program (e.g. ECE, CS, Physics, etc.)

(b) Current Graduate Advisees

Full-time PhD:

Karthikeyan Shanmugam (2011-)

Megasthenis Asteris (2011-)

Dimitris Papailiopoulos (2009-)

Part-time PhD:
--
MS Thesis or Report:

- Negin Golrezaei
  (2011-2013) Graduated from USC. Joined USC Business School PhD Program.
- Sarabjot Khangura
  (2011-2012) Graduated from USC. Joined Startup.
- Yi-Hsuan (Griffey) Kao
  (2011-2012) Graduated from USC. Joined USC PhD Program.

4. Current Research Projects and Grants

CAREER: Network Coding Theory for Distributed Storage, NSF, PI: Dimakis, 2/2011 - 1/2016.
Total Award: $470,000.

D2D Wireless Video: Breaking the Cellular Capacity Bottleneck for Efficient Video Delivery, PI: Caire (USC), CoPIs: Dimakis, Molisch, 1/2011-1/2014, Total award $300,000.

Cloud Content Management in Vehicular Networks, (Research contract with USC), PI: Krishnamachari (USC), CoPI: Dimakis, 10/2011-9/2012, Total award: $100,000.

5. Proposal Submissions

Title, agency, PI, role, amount, duration

1. NSF EARS: Distributed Caching and Collaboration for Higher Spectral Efficiency, PI: Dimakis, CoPI: Caire (USC), Molisch (USC), 4 year project, $500,000

B. Teaching

6. Special Projects, Lab and Course Developments, etc.

EE599 (USC). New course development. Topic: Distributed storage theory. Number of students (11), Number of survey forms returned (10). (Average instructor evaluation: 4.8/5. Average course evaluation: 4.7/5).

C. Service Activities

7. University Service

1. USC Graduate Admissions Committee
2. USC Seminar organizing Committee.

9. Technical Society Service

1. Technical Program Committee Member, IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP '11).
2. Technical Program Committee Member, IEEE International Symposium on Network Coding (NetCod), June 2011.
3. Symposium Co-Chair, IEEE Globecom 2011, Selected Areas in Communications Symposium, Data Storage Track. December 5-9, 2011.

D. Other Items of Interest

E. Plans for the Coming Year

SUMMARY OF ACTIVITIES FOR Alexandros G. Dimakis

September 1, 2012 – August 30, 2013

A. Research:

1. Awards and Honors

Google Faculty Research Award: for research on `Coding theory for big data', 2012.

2. Invited Addresses and Colloquia

1. "Network Coding for Cloud Storage," MIT LIDS Seminar (joint with Theory of Computation Seminar), Dec. 2012
2. "Distributed Storage Codes and Applications," Invited Speaker, Docomo Innovations, Palo Alto, CA, Feb. 2013.
3. "Distributed Storage Codes and Applications," Invited Speaker, Google, Mountain View, CA. Feb. 2013.
4. "Asymptotics of Large-Scale Interacting Networks Workshop," Invited Speaker, Banff International Research Station (BIRS), Canada, March 2013.
5. "An Overview of Network Coding for Cloud Storage," Invited Speaker and Area Chair, NSF-ECCS Workshop "Big Data: From Signal Processing to Systems Engineering," Arlington, VA, March 2013.

3. Publications

(a) Journals and books

Indicate published, accepted for publication, revised or submitted and under review.

Published:

1. M. Sathiamoorthy, A. Dimakis, B. Krishnamachari and F. Bai, "Distributed Storage Codes Reduce Latency in Vehicular Networks," IEEE Transactions on Mobile Computing, Issue 99, pp. 1-12, June 2013. http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=6541941
2. D. S. Papailiopoulos, A.G. Dimakis, and V.R. Cadambe, "Repair Optimal Erasure Codes through Hadamard Designs," IEEE Transactions on Information Theory, vol. 59(5), pp. 3021-3037, May 2013. http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6416066
3. N. Golrezaei, A.F. Molisch, A.G. Dimakis, and G. Caire, "Femtocaching and Device-to-Device Collaboration: A New Architecture for Wireless Video Distribution," IEEE Communications Magazine, vol. 51(4), pp. 142-149, April 2013. http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6495773
4. M. Sathiamoorthy, M. Asteris, D. Papailiopoulos, A.G. Dimakis, R. Vadali, S. Chen, and D. Borthakur, "XORing Elephants: Novel Erasure Codes for Big Data," Proceedings of the VLDB Endowment, vol. 6(5), pp. 325-336, March 2013. http://dl.acm.org/citation.cfm?id=2488339
5. A. Khajehnejad, A.G. Dimakis, B. Hassibi, B. Vigoda, and W. Bradley, "Reweighted LP Decoding for LDPC Codes," IEEE Transactions on Information Theory, vol. 58(9), pp. 5972-5984, Sept. 2012.

(b) Refereed Conference Proceedings

1 D. Papailiopoulos, A. Dimakis, and S. Korokythakis, "Sparse PCA through Low-rank Approximations," International Conference on Machine Learning (ICML), vol. 28(3), pp. 747-755, 2013.
http://jmlr.org/proceedings/papers/v28/

2 I. Tamo, D.S. Papailiopoulos, and A.G. Dimakis, "Optimal Locally Repairable Codes and Connections to Matroid Theory," IEEE International Symposium on Information Theory (ISIT 2013), pp. 1814-1818, Istanbul, Turkey, July 2013.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6620540

3 Y.-H. Kao, A.G. Dimakis, D. Leong, and T. Ho, "Distributed Storage Allocations and a Hypergraph Conjecture of Erdos," 2013 IEEE International Symposium on Information Theory (ISIT), pp. 902-906, Istanbul, Turkey, July 2013.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6620357

4 A.S. Tehrani, A.G. Dimakis, and G. Caire, "Optimal Measurement Matrices for Neighbor Discovery," IEEE International Symposium on Information Theory (ISIT), pp. 2134-2138, Istanbul, Turkey, July 2013.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6620603

5 K. Shanmugam, A.G. Dimakis, and M. Langberg, "Local Graph Coloring and Index Coding," IEEE International Symposium on Information Theory (ISIT), pp. 1152-1156, Istanbul, Turkey, July 2013.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6620407

6 A. Le, A.S. Tehrani, A.G. Dimakis, and A. Markopoulou, "Instantly Decodable Network Codes for Real-Time Applications," 2013 International Symposium on Network Coding (NetCod), pp. 1-6, Calgary, AB, June 2013.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6570827

7 A.S. Tehrani, A.G. Dimakis, and G. Caire, "Optimal Deterministic Compressed Sensing Matrices," 2013 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), pp. 5895-5899, Vancouver, BC, May 2013.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6638795

8 N. Golrezaei, A.G. Dimakis, and A.F. Molisch, "Device-to-Device Collaboration through Distributed Storage," 2012 IEEE Global Communications Conference (GLOBECOM), pp. 2397-2402, Anaheim, CA, Dec. 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6503475

9 A.S. Tehrani and A.G. Dimakis, "Finding Three Transmissions is Hard," 2012 IEEE Global Communications Conference (GLOBECOM), pp. 2293-2298, Anaheim, CA, Dec. 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6503457

10 W. Xu, A.G. Dimakis, and B. Hassibi, "On the Mixing Time of Markov Chain Monte Carlo for Integer Least-Square Problems," 2012 IEEE 51st Annual Conference on Decision and Control (CDC), pp. 2545-2550, Maui, HI, Dec. 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6425890

11 N. Golrezaei, A.G. Dimakis, and A.F. Molisch, "Wireless Device-to-Device Communications with Distributed Caching," IEEE International Symposium on Information Theory (ISIT), pp. 2781-2785, Cambridge, MA, July 2012.
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?tp=&arnumber=6284029

(c) Conference Presentations Without Proceedings of Full Papers
None

3. Student Advising

(a) Completed PhD Theses
Names of students and program (e.g. ECE, CS, Physics, etc.)

(b) Current Graduate Advisees

Full-time PhD:

Ethan Elenberg (2012-) (joint with S. Vishwanath)

Murat Kocaoglu (2013-) (joint with S. Vishwanath)

Karthikeyan Shanmugam (2011-)

Megasthenis Asteris (2011-)

Dimitris Papailiopoulos (2009-)
Expected graduation May 2014.

Part-time PhD:
--
MS Thesis or Report:

Samer Chucri (2012-2013). Graduated from UT Austin. Joined Google.

4. Current Research Projects and Grants

Design and Analysis of Novel Compressed Sensing Algorithms via Connections with Coding Theory, NSF, PI: Dimakis, Pfister (TAMU), 9/2012 - 8/2015. Total Award Amount: $470,000. Dimakis: $217,000

CAREER: Network Coding Theory for Distributed Storage, NSF, PI: Dimakis, 2/2011 - 1/2016.
Total Award: $470,000.

Coding for Big Data, Google Research Award, 7/2012- 7/2014, PI: Dimakis, Total Award: $60,000

5. Proposal Submissions

Title, agency, PI, role, amount, duration

1. NSF ECCS Metamaterial Enhanced Interference Alignment: Theory and Practice. PI: Dimakis, CoPIs: Vishwanath, Alu. 4 year project, $1,200,000

2. NSF NeTS: Small: Collaborative Research: Femtocaching: Distributed Caching and Collaboration for Wireless Video.
PI: Dimakis, CoPIs: Caire, Molisch (USC). 3 year project, $250,000

3. NSF CIF: Large: Collaborative Research: Content Delivery over Heterogeneous Networks: Fundamental Limits and Distributed Algorithms.
PI: Dimakis, CoPI: Viswanathan (UIUC), Ramchandran (Berkeley), Medard (MIT). 3 year project, $500,000.

B. Teaching

6. Special Projects, Lab and Course Developments, etc.

EE313 (16110) Linear Systems and Signals. Spring 2013. Number of students (54), Number of survey forms returned (36). Average Instructor evaluation (4.0/5.0).

C. Service Activities

7. University Service

1. Prequal screening Committee

2. Semester Course Evaluation

3. Graduate Admissions Committee

8. Technical Society Service

1. Technical Program Committee Member, ACM MOBIHOC, July 29 – August 1, 2013.
2. Technical Program Committee Member, IEEE International Symposium on Information Theory (ISIT), July 7-12, 2013.
3. Publicity Chair, IEEE International Symposium on Network Coding (NetCod), June 7-9, 2013.
4. Technical Program Committee Member, IEEE INFOCOM, April 14-19, 2013.
5. Workshop Chair, IEEE Consumer Communications and Networking Conference (CCNC), January 11-14, 2013.

D. Other Items of Interest

E. Plans for the Coming Year

SUMMARY OF ACTIVITIES FOR Alexandros G. Dimakis

September 1, 2013 – August 30, 2014

A. Research:

1. Awards and Honors

Army Research Office Young Investigator Award (ARO YIP): Learning Network Properties through Low Rank Approximations. Awarded July 2013.

2. Invited Addresses and Colloquia

Keynote speaker, Workshop on Big Dynamic Distributed Data (in conjunction with VLDB 2013).

3. Publications

(a) Journals and books

Indicate published, accepted for publication, revised or submitted and under review.

Accepted:

T.K. Dikaliotis, A.G. Dimakis, T. Ho, M. Effros,
``On the Delay Advantage of Coding in Packet Erasure Networks."
IEEE Transactions on Information Theory, 2014 (to appear).

A. Megasthenis, A.G. Dimakis,
``Repairable Fountain Codes,"
IEEE JSAC Special issue on Distributed Storage, 2014 (to appear).

K. Shanmugam, D.S. Papailiopoulos , A.G. Dimakis and G. Caire,
``A Repair Framework for Scalar MDS Codes,"
IEEE JSAC Special issue on Distributed Storage, 2014 (to appear).

Published:

K. Shanmugam, N. Golrezai, A. F. Molisch, A.G. Dimakis, and G. Caire,
``FemtoCaching: Wireless Video Content Delivery through Distributed Caching Helpers,"
IEEE Transactions on Information Theory, Vol.: 59 Issue: 12, Pg. 8402-8413, 2013.

M. Sathiamoorthy, M. Asteris, D. S. Papailiopoulos, A.G. Dimakis, R. Vadali,
S. Chen, D. Borthakur,
``XORing Elephants: Novel Erasure Codes for Big Data," Proceedings of the VLDB Endowment, Vol 6, No 5, 325-336, March 2013.

M. Sathiamoorthy, A.G. Dimakis, B. Krishnamachari and F. Bai,
``Distributed Storage Codes Reduce Latency in Vehicular Networks,"
IEEE Transactions on Mobile Computing, Issue 99, Pg. 2646-2650 , 2013.

D. S. Papailiopoulos, A.G. Dimakis, V. R. Cadambe,
``Repair Optimal Erasure Codes through Hadamard Designs,"
IEEE Transactions on Information Theory, Vol 59 (5), 3021-3037, 2013.

N. Golrezai, A. F. Molisch, A.G. Dimakis, and G. Caire, ``Femtocaching and Device-to-Device Collaboration: A New Architecture for Wireless Video Distribution," IEEE Communications Magazine, Volume: 51 (4), 142-149, 2013.

Submitted:
D. Papailiopoulos and A.G. Dimakis,
``Locally Repairable Codes"
IEEE Transactions on Information Theory (submitted)

N. Golrezaei, A.G. Dimakis, A.F. Molisch,
``Scaling Behaviors of Wireless Device-to-Device Communications with Distributed Caching,"
IEEE Transactions on Information Theory, (submitted August 2012, Revised July 2013).

I. Tamo, D. Papailiopoulos, A. G. Dimakis,
``Optimal Locally Repairable Codes and Connections to Matroid Theory,"
IEEE Transactions on Information Theory, (submitted Nov 2013)

N. Golrezaei, P. Mansourifard, A. F. Molisch, A. G. Dimakis,
``Base-Station Assisted Device-to-Device Communications
for High-Throughput Wireless Video Networks"
IEEE Transactions on Wireless Communications (under revision).

B. Hassibi, M. Hansen, A.G. Dimakis, H.A.J. Alshamary, W. Xu
``Optimized Markov Chain Monte Carlo for Signal Detection in MIMO Systems: an Analysis of the Stationary Distribution and Mixing Time,"
IEEE Transactions on Signal Processing (submitted December 2013).

A. Le, A.S. Tehrani, A.G. Dimakis, and A. Markopoulou
``Instantly Decodable Network Codes for Real-Time Applications,"
Submitted for publication (December 2013).

(b) Refereed Conference Proceedings
Indicate published or accepted for publication.

K. Shanmugam, A.G. Dimakis, G. Caire
``Index Coding Problem with Side Information Repositories"
Allerton Conference on Communication, Control, and Computing, 2013.

D.S. Papailiopoulos, A.G. Dimakis, S. Korokythakis,
``Sparse PCA through Low-rank Approximations,"
International Conference on Machine Learning (ICML), 2013.

A. Le, A.S. Tehrani, A.G. Dimakis, A. Markopoulou,
``Instantly Decodable Network Codes for Real-Time Applications,"
International Symposium on Network Coding (NetCod), June 2013.

I. Tamo, D. Papailiopoulos and A.G. Dimakis,
``Optimal Locally Repairable Codes and Connections to Matroid Theory,"
IEEE International Symposium on Information Theory (ISIT 2013).

Y. Kao, A.G. Dimakis, D. Leong and T. Ho,
``Distributed Storage Allocations and a Hypergraph Conjecture of Erdos,"
IEEE International Symposium on Information Theory (ISIT 2013).

A.S. Tehrani, A.G. Dimakis and G. Caire,
``Optimal Measurement Matrices for Neighbor Discovery,"
IEEE International Symposium on Information Theory (ISIT 2013).

K. Shanmugam, A.G. Dimakis and M. Langberg,
``Local Graph Coloring and Index Coding,"
IEEE International Symposium on Information Theory (ISIT 2013).

A.S. Tehrani, A.G. Dimakis, G. Caire,
``Optimal Deterministic Compressed Sensing Matrices,"
IEEE International Conference on Acoustics, Speech, and Signal Processing
(ICASSP 2013).

(c) Conference Presentations Without Proceedings of Full Papers
None

3. Student Advising

(a) Completed PhD Theses
Names of students and program (e.g. ECE, CS, Physics, etc.)

(b) Current Graduate Advisees

Full-time PhD:

Ethan Elenberg (2012-) (joint with S. Vishwanath)

Murat Kocaoglu (2013-) (joint with S. Vishwanath)

Karthikeyan Shanmugam (2011-)

Megasthenis Asteris (2011-)

Dimitris Papailiopoulos (2009-)
Expected graduation May 2014.

Part-time PhD:
--
MS Thesis or Report:

Samer Chucri (2012-2013). Graduated from UT Austin. Joined Google.

4. Current Research Projects and Grants

DARPA STTR Grant joint with Continuum Analytics, potentially extendable to Phase II.
PI: Dimakis, 06/01/2014 - 11/30/2014. Total Award: $100,000. Dimakis amount: $30,000.

Design and Analysis of Novel Compressed Sensing Algorithms via Connections with Coding Theory, NSF,
PI: Dimakis, Pfister (TAMU), 9/2012 - 8/2015. Total Award Amount: $470,000. Dimakis: $217,000

CAREER: Network Coding Theory for Distributed Storage, NSF, PI: Dimakis, 2/2011 - 1/2016.
Total Award: $470,000.

Coding for Big Data, Google Research Award, 7/2012- 7/2014, PI: Dimakis, Total Award: $60,000

5. Proposal Submissions

Title, agency, PI, role, amount, duration

1. CIF: Small: Sparsity in Quadratic Optimization through Low-Rank Approximations, NSF, PI: Dimakis, 09/01/2014 - 08/31/2017, $467,992.
(awarded)

2. YIP: Learning Network Properties through Low Rank Approximations, ARO YIP, PI: Dimakis, 09/01/2014 - 08/31/2017, $150,000.
(awarded)

3. CIF: Medium: Collaborative Research: Content Delivery over Heterogeneous Networks: Fundamental Limits and Distributed Algorithms, NSF, Co-PI: Dimakis, PI: P. Viswanath (UIUC), 08/01/2014 - 07/31/2017, $1,200,000
(awarded)

4. Large Network Analysis through Low Rank Approximations, AFOSR YIP, PI: Dimakis, 01/02/2014 - 01/01/2017, $360,000.
(declined)

5. TWC: Medium: Covert Channels for Defense: Virtualization Mechanisms for a Transparent Cloud, NSF, Co-PI: Dimakis, Vishwanath PI: M. Tawari. 08/01/2014-07/31/2017, $1,182,969
(declined)

B. Teaching

6. Special Projects, Lab and Course Developments, etc.

EE313 (16110) Linear Systems and Signals. Spring 2013. Number of students (54), Number of survey forms returned (36). Average Instructor evaluation (4.0/5.0).

EE313 (16525) Linear Systems and Signals. Fall 2013. Number of students (56), Number of survey forms returned (37). Average Instructor evaluation (4.4/5.0).

C. Service Activities

7. University Service

2. CommNetS seminar committee (joint with E. Nikolova)
3. Prequal screening Committee
4. Semester Course Evaluation
5. Graduate Admissions Committee
6. Windale conference program chair
7. Texas Wireless Summit Committee

8. Technical Society Service

Information Theory Society, Ad-hoc Committee on Future Directions on Information Theory, 2014. Information Theory Society, Information Theory School sub-committee, 2014.
(Associate Editor) IEEE Signal Processing Letters.

(Guest Editor), Journal of Communications and Networks (JCN), Special issue on Coding for Wireless Storage. (with Camilla Hollanti, Tracey Ho and F. Lu).

Technical Program Committees:
5th Annual Non-Volatile Memories Workshop (NVMW 2014),
IEEE Int. Symp. on Information Theory (ISIT) 2013, 2014.
Thirteenth ACM SIGMOBILE International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc) 2013

D. Other Items of Interest

Our group's research on distributed storage codes and the impact on cloud storage systems has been discussed in the influential technical blogs:
http://highscalability.com/blog/2013/6/27/paper-xoring-elephants-novel-erasure-codes-for-big-data.html
http://storagemojo.com/2013/06/21/facebooks-advanced-erasure-codes/

E. Plans for the Coming Year

The main plan for the next year is to develop research on big graph analytics through low-rank approximations as described in submitted proposals 1,2 and 4. Furthermore our group is developing the design of distributed storage codes for cold and hot-data analytics and fostering collaborations with Facebook, Ebay and Verizon.

Budget Council Statement on Teaching

Introduction

Dr. Alex Dimakis is one of our most successful young faculty members with teaching and research interests in the areas of large-scale systems, network coding, signal processing, and stochastics. He brings deep insights and a growing global reputation into the classroom environment, which positively impacts both his undergraduate and graduate instruction.

Summary: Superior, committed, deeply thoughtful, engaging teacher and communicator; much respected and admired by students.

Principal Areas of Teaching

Dr. Alex Dimakis has been teaching at the university level for 10 semesters. Seven of these semesters of teaching were at the University of Southern California (USC), while three were at The University of Texas at Austin (UT-Austin).

While at USC, Dr. Dimakis taught EE 464 (Probability for Engineers) at the combined Undergraduate/Graduate level for two semesters, and also taught three graduate courses: EE 568 (Coding Theory), a core graduate course, and EE 599, an Advanced Topics course which he taught twice, with two different topics (Large-Scale Systems, Coding and Message Passing) and (Distributed Storage). The EE 464 course is a core course for both undergraduate and graduate students.

Here at UT-Austin, at the undergraduate level, Dr. Alex Dimakis has taught the course EE 313 (Linear Systems and Signals) twice. This is a required course for all ECE students, and indeed, is an entry into the core curricula and higher-level courses in communication theory, systems theory, signal processing, and many other areas. At the graduate level, he has taught the class EE 381V Advanced Topics in Coding Theory. This class falls in the broad area of Communications, Networks and Systems (CommNetS) – an official topical graduate area defined within the ECE Department. The Coding Theory class is an advanced class on Information Theory and Coding, predominantly taken by more advanced M.S. or Ph.D. students. The class focuses on Index Coding and Distributed Storage, which are exceedingly important topics in this age of "the Cloud" and "Big Data."

Teaching Evaluation Procedures and Measures

I am quite familiar with Dr. Dimakis' area of teaching and research. I have carefully reviewed his teaching record towards making this statement as comprehensive and accurate as possible. I am a faculty member in the Department of Electrical Engineering and an expert in signal, image, and video processing. My evaluation rests on my understanding of his work, on reviewing his teaching record, classes taught, evaluations, and peer review.

Several members of the Budget Council reviewed this statement including Professor Al Bovik (myself), and Professor Francois Baccelli.

Dr. Dimakis' teaching has been evaluated by two standard methods:

1. End-of-semester student course evaluations;
2. Peer faculty assessment by a colleague attending his lecture.

The student evaluations utilized the standard UT online course instructor survey (CIS). Prof. Francois Baccelli conducted the faculty evaluation. He also met with Dr. Dimakis following the evaluation to provide detailed feedback.

Summary of Teaching Evaluations

At USC

Course	Semester	Enroll / Response	Instructor/Course Rating
EE568 (Coding Theory, Core Grad)	Spring 12	12/10	4.4 / 4.2
EE599 (Adv. Coding & Info Theory)	Fall 11	11/10	4.8 / 4.7
EE464 (Probability, MS level)	Fall 10	32/29	4.5 / 4.0
EE464 (Probability, MS level)	Fall 10	48 / 43	4.6 / 4.3
EE599 (Adv. Topics, Message Passing Algorithms)	Fall 09	19 / 19	4.6 / 4.4

These scores, like those at UT-Austin are recorded on a 1-to-5 scale with 5 being the best score. The explanation of the scores is the same as is in done for UT-Austin (instructor score/average score of instructors in that class). Clearly, while at USC, Prof. Dimakis was a stellar teacher, which is one important reason why the ECE Department at UT-Austin sought to hire him. Prof. Dimakis' potential as a teacher was also evident during the interview process, during which he gave clear, informative and entertaining talks. UT ECE faculty were also enthusiastic to hire Prof. Dimakis to UT-Austin, based not only on his record, but on his well-prepared and excellent talks, all presaging an excellent university lecturer.

At UT-Austin

Course	Semester	Enroll / Response	Instructor/Course Rating
EE 381V (Advanced Coding Theory)	Spring 14	9/9	4.7 / 4.6
EE 313	Fall 13	56 / 37	4.4 / 3.8
EE 313	Spring 13	54 / 36	4.0 / 3.5
	5 year avg for EE313	52	3.9 / 3.7

Since arriving at UT-Austin. Prof. Dimakis has proven to be a well-above-average teacher, and in fact an excellent one, based on his course evaluations. EE 313 is taught every year in large sections, and it is one of the most important courses that can be taught in any undergraduate ECE curriculum. Professor Dimakis is one of the most effective and popular instructors to have taught the course in recent years. Indeed, his average Instructor Evaluations scores are significantly higher than the average scores attained by other instructors of the course. He has embraced the challenge of teaching this critical material by using innovative teaching and student challenges and importantly, improving his skills (as evidenced by the student evaluations).

Quotes from Teaching Evaluations

Professor Alex Dimakis has a very student-oriented and personal style of teaching. He frequently engages the students and is generally quite accessible both within and outside the classroom.

Some of the comments left by students are given below, and highlight Dr. Dimakis' deep skills and interest in lecture-oriented instruction, both inside and outside of class:

"Very well-organized class with the most up-to-date topics in the field."

"I learned several tools that were both interesting and useful."

"Dr. Dimakis is an excellent professor who is passionate about his subject"

"This has been by far my favorite course taken at UT. Dr. Dimakis is a great communicator"

"Especially helpful in office hours"

Negative comments left by students are also informative. In our view, these affirm the courage and insistence required of an emerging master teacher towards engaging students to enter upon a difficult topic. The negative comments also speak to the highly theoretical nature of this course and the difficulty of the material. Such commentary is not regarded by the budget council as indicating a problem in instruction.

"I feel that he breezed through some tough topics"

"Pointless, tedious homework"

"I think Dr. Dimakis is a good professor and the only thing I would suggest him to give a more exact review for the midterms"

Balance Between Graduate and Undergraduate Teaching

Dr. Dimakis has taught one required undergraduate course that is a key part of the curriculum. At the graduate level, he has taught an advanced topics graduate course. In the ECE department, it is expected of all faculty, even highly research oriented faculty such as Dr. Dimakis, to teach at least one substantial undergraduate ECE course during each academic year. Dr. Dimakis has done this every year during his tenure at UT-Austin.

Recognition of Teaching Excellence

While he has not yet won any individual teaching awards in ECE, Dr. Dimakis did win an important journal Best Paper Award for his research in current rank of Assistant Professor. In our area, and in ECE generally, Dr. Dimakis is highly respected for his effectiveness in teaching a demanding basic undergraduate course and a leading edge research-oriented graduate course.

Teaching Portfolio

From his Teaching Portfolio, it is clear that Dr. Dimakis teaches classes which are mathematically rigorous and highly analytical. He tries to motivate and engage students by providing examples, as much as possible, and asking questions.

Participation on Graduate Committees

Dr. Dimakis has graduated 2 Ph.D. students while in-rank (one at USC (co-supervised), and one at UT-Austin), which is beyond expectations. He currently supports 6 PhD students (3 co-supervised) and two post-docs. He is active in serving on thesis and dissertation committees. Overall, these numbers are exemplary.

Innovative Contributions

The class EE381V "Advanced Topics in Coding Theory," developed by Dr. Dimakis, represented a new type of course offering in UT ECE. The class developed models and analysis for coding theory, beginning from classical methods and extending to recent state-of-the-art distributed storage codes. The material is both timely and extremely practical, combining threads from multiple disciplines, including ECE, Math, and Computer Science.

Class description: ***EE 381V – Advanced Topics in Coding Theory****: This is a graduate level course on modern coding theory. The main goal is to cover multi-user, combinatorial and graph theoretic techniques. The class covers the classical theory of Shannon graph capacity (going back to Shannon's 1953 paper and Lovasz's 1979 breakthrough that initiated semidefinite programming). This material is connected to modern problems on index coding and distributed storage codes used in distributed file systems like Hadoop and the Google File System. Combinatorial optimization and graph theoretic methods for designing and optimizing code parameters are discussed.*

In-Class Peer Evaluation

As part of the process of evaluating Prof. Dimakis' teaching effectiveness, a peer evaluation was conducted whereby Prof. Francois Baccelli attended a lecture given by Prof. Dimakis. Prof. Baccelli is a renowned teacher and researcher with many international research awards and currently holds the Simon Chair. His evaluation is attached at the end of this Statement.

Summary

Based on my study of Dr. Alex Dimakis' teaching career at UT-Austin, and in consultation with my colleagues, we believe that Dr. Dimakis is highly qualified for promotion to Associate Professor, in regards to teaching.

Prepared by

Alan C. Bovik

Professor and Holder of
The Curry / Cullen Trust Endowed Chair
Department of Electrical and Computer Engineering
The University of Texas at Austin

TEACHING STATEMENT

Alex Dimakis
Assistant Professor
University of Texas at Austin

> One kid says to me, "See that bird? What kind of bird is that?" I said, "I haven't the slightest idea what kind of a bird it is." He says, "It's a brown-throated thrush. Your father doesn't teach you anything!" But it was the opposite. He had already taught me: "See that bird?" he says. "It's a Spencer's warbler." (I knew he didn't know the real name.) "Well, in Italian, it's a Chutto Lapittida. In Portuguese it's a Bom da Peida. In Chinese, it's a Chung-long-tah, and in Japanese, it's a Katano Tekeda. You can know the name of the bird in all the languages of the world, but when you're finished, you'll know absolutely nothing about the bird.
>
> My father taught me to notice things. One day, I was playing with an "express wagon," a little wagon with a railing around it. It had a ball in it, and when I pulled the wagon, I noticed something about the way the ball moved. I went to my father and said, "Say, Pop, I noticed something. When I pull the wagon, the ball rolls to the back of the wagon. And when I'm pulling it along and I suddenly stop, the ball rolls to the front of the wagon. Why is that?"
> "That, nobody knows," he said. "The general principle is that things which are moving tend to keep on moving, and things which are standing still tend to stand still, unless you push them hard. This tendency is called 'inertia,' but nobody knows why it's true." Now, that's a deep understanding. He didn't just give me the name.
>
> Richard Feynman, "The Making of a Scientist"

My teaching goal is to avoid the Chutto Lapittidas, the Bom da Peidas and the Chung-long-tahs of teaching: the meaningless enumeration of engineering and mathematical facts in classrooms where students struggle to stay awake. I make an effort in every lecture to pause and ask higher-level questions: Why do our senses perceive sound and light in a logarithmic scale (and why should some plots be in dB)? Why do we convert music from the analog world to digital form and back to analog? (to handle noise, as Shannon showed). When we say that there is a 5% probability that California will have a major earthquake in the next ten years, what does that mean? That if we had twenty copies of California, one would have the earthquake? The main goal of my teaching, above and beyond pushing facts and methodologies into the brains of my students, is to make them *think* and *question everything*. This, I believe, nurtures creativity and innovation, skills that are becoming increasingly important as computers render standard engineering calculation skills irrelevant.

Subsequently, I describe my teaching experiences, new course design and teaching innovations that I developed during my seven semesters as an assistant professor at USC and three semesters at UT Austin.

In Fall 2009, I designed and taught a new graduate course on large-scale systems, coding, and message passing algorithms. The course combined elements from coding theory, communications and signal processing under the common framework of message passing algorithms and linear programming relaxations for hard combinatorial problems. Novel signal processing results in compressed sensing were presented in a unified framework with LP decoding for LDPC codes. Interesting theoretical connections between coding theory and compressed sensing were discovered by me and my students [C32, J15] while we were working on understanding the class material. This was an advanced special topics class focused on research. 19 students completed the course, with backgrounds in signal processing, communications, computer engineering and also one

student from the physics department. Two research papers evolved from class projects. (Average Instructor evaluation: 4.64/5, Average Course evaluation: 4.47/5)

In Fall 2010, I taught EE464 Probability Theory for Engineers, a class with large enrollment (90 students). Undergraduate, Masters and a few distance-learning students were taking the class. The course was split into two sections, and 8 students took the class remotely by watching lecture videos. It was a significant challenge to teach a larger class and to maintain multiple levels of difficulty— keeping the course accessible, but at the same time challenging for the stronger students. Overall, I enjoyed covering the material and created multiple problem sets and more open-ended projects to help students understand probabilistic concepts. (Average instructor evaluation: 4.55/5. Average course evaluation: 4.22/5).

In Fall 2011, I developed a new advanced information theory course called ``Distributed Storage Theory,'' building on my research expertise in this emerging area. The course builds on coding theory used in RAID architectures, including array codes as well as novel sparse graph codes. We discussed results for security and privacy in distributed storage. In the last part of the course the students were introduced to the Hadoop Mapreduce framework, and we discussed algorithmic and systems papers in this space. I plan to offer this course again and dedicate a significant part of it to hands-on mapreduce processing for large datasets and coding methods over Hadoop. Eleven students were enrolled, with backgrounds in communications and computer engineering, and several class projects have further developed into research papers. (Average instructor evaluation: 4.8/5. Average course evaluation: 4.7/5).

Teaching at UT Austin

During Spring and Fall 2013, I taught the core undergraduate class EE313 Linear Systems and Signals. This class is an introduction to systems, convolution, Fourier, Laplace, and Z-transforms. It is foundational material that is a pre-requisite for several other classes, and it has applications in a wide variety of areas such as communications, signal processing, photonics, and circuit design. EE313 requires abstract thinking and is one of the first courses that shape the thinking of theoretical engineers. I decided to try several new ideas in my mode of instruction. I taught the class through handwriting on the doc-cam and made my scanned notes immediately available after class. This was a massive hit with the students since they did not need to copy my calculations during the lecture and could instead focus on the concepts.

After teaching EE313 during Spring 2013, I realized that perhaps the biggest issue that students had with the class was their limited experience in Matlab programming. For that reason, during the Fall 2013 EE313 Signals and Systems class, I created two 'grand challenges' for extra credit.

The first grand challenge was based on voice distortion, which involved students making a Matlab program that changed their voices in `interesting ways,' for example: making their voice sound robotic. For the second challenge, I wrote a Matlab program called AMMIE (the Aw-some Matlab Musical Instrument Experiment) that synthesized music in Matlab. The challenge involved modifying the AMMIE program in different ways to generate more interesting music. For example, AMMIE played a simple tone (sinusoid) for each input note, and students were asked to modify that tone to add more frequencies and time variations, possibly helping AMMIE produce realistic instrumental sounds. Both challenges were intentionally open-ended: I asked the students to be creative and simply do whatever they thought was cool. The only constraint was that only Matlab can be used and everything had to be generated using their own code. For grading purposes I asked for the input and output wav files (for voice) and output wav file (for music) and their source code.

In total, 26 out of the 57 enrolled students turned in solutions to the grand challenges. Students tried various techniques, ranging from linear filters and frequency domain modifications (covered in class) to all sorts of non-linear filtering ideas. Overall, the creativity and participation exceeded my expectations, given the small extra credit that was involved. The winner in both challenges was Stephen Chiang who modified AMMIE into MIA (the Matlab Instrumental Acoustics program) that consists of more than 300 lines of code and synthesizes flute, saxophone, clarinet and bassoon instruments. I encouraged Stephen to make his software open source and upload it on Github: https://github.com/UTAustin/MIA

In the teaching portfolio grand challenges folder, I include several examples of voice modification and music that were produced by the Matlab programs that the students wrote.

(Average instructor evaluation: 4.0/5 and 4.4/5. Average course evaluation: 3.5/5 and 3.8/5 for Spring and Fall respectively).

During Spring 2014, I taught my first graduate class at UT Austin, **EE381V Advanced Topics in Coding Theory.** The informal course title was actually "Postmodern Coding Theory" since I covered what was happening in active research after the material currently called modern coding theory (*i.e.*, after LDPC codes, message passing algorithms, *etc.*). The class was a very rewarding experience. I learned and created notes and problems for material that has not been covered before in a single course, to the best of my knowledge. I covered the classical theory of Shannon graph capacity (going back to Shannon's 1953 paper and Lovasz's 1979 breakthrough that initiated semidefinite relaxations) and the connections of this material to the modern problems of index coding and distributed storage codes. Three class projects (out of the 9 in the class) have already been submitted as research papers, and I expect several others can develop into publications.
In the teaching portfolio I include the latex lecture notes that I plan to improve in the next offering of the course and eventually turn into a book on combinatorial coding theory.
(Average instructor evaluation: 4.7/5. Average course evaluation: 4.6/5).

Teaching Evaluations

The course descriptions are as listed above.

Course	Semester	Enroll / Response	Instructor/Course Rating
EE 381V (Advanced Coding Theory)	Spring 14	9/9	4.7 / 4.6
EE 313	Fall 13	56 / 37	4.4 / 3.8
EE 313	Spring 13	54 / 36	4.0 / 3.5
	5 year avg for EE313	52	3.9 / 3.7
At USC			
EE568 (Coding Theory, Core Grad)	Spring 12	12/10	4.4 / 4.2
EE599 (Adv. Coding & Info Theory)	Fall 11	11/10	4.8 / 4.7
EE464 (Probability, MS level)	Fall 10	32/29	4.5 / 4.0
EE464 (Probability, MS level)	Fall 10	48 / 43	4.6 / 4.3
EE599 (Adv. Topics, Message Passing Algorithms)	Fall 09	19 / 19	4.6 / 4.4

PhD Supervisions Completed

Maheswaran Sathiamoorthy (co-supervised with B. Krishnamachari, USC) - Graduated in December 2013 from USC. Joined Google as a software engineer in the infrastructure team.

Dimitrios Papailiopoulos - Graduated in May 2014 from UT Austin. Joined UC Berkeley as a postdoctoral researcher working with K. Ramchandran and B. Recht.

M.S. Supervisions completed

Samer Chucri (2012-2013). Graduated from UT Austin. Joined Google.

Negin Golrezaei (2011-2013) Graduated from USC. Joined USC Business School PhD Program.

Sarabjot Khangura (2011-2012) Graduated from USC. Joined Startup.

Yi-Hsuan (Griffey) Kao (2011-2012) Graduated from USC. Joined USC ECE PhD Program.

PhD Supervisions Ongoing:

Erik Lindgren – Joining UT in Fall 2014.

Shanshan Wu (co-advised with S. Sanghavi) – Joining UT in Fall 2014.

Ethan Elenberg (co-advised with S. Vishwanath) – Joined UT in Fall 2012.

Murat Kocaoglu (joint with S. Vishwanath) – Joined UT in Fall 2013.

Karthikeyan Shanmugam – Joined USC in 2011. Moved to UT in Fall 2013. Qualifying exam planned for early 2015.

Megasthenis Asteris – Joined USC in 2011. Moved to UT in Fall 2013. Qualifying exam planned for early 2015.

Postdoctoral Advising

Michael Borokhovich joined UT in Spring 2014 after receiving his PhD in Ben Gurion University in Israel. (Collaborates with my group and Prof. Vishwanath's group).

Anastasios Kyrillides will be joining UT in Fall 2014 after receiving his PhD from EPFL Switzerland. (Joint with Prof. Caramanis and Prof. Sanghavi.)

Candidate's Statement on Teaching

Table 1. Teaching Summary

Metric	Value
Average Instructor Evaluation (2009-2014)	4.50
Average Instructor Evaluation (last 3 years)	4.18
Average Course Evaluation (2009-2014)	4.37
Average Course Evaluation (last 3 years)	4.02
# of Teaching Awards	-
PhD Students Completed *	1.5 (1 sole advisor)
MS Students Completed *	4 (4 as sole advisor)
PhD Students in Pipeline (as of 09/2014) *	4.5 (3 as sole advisor)
MS Students in Pipeline (as of 09/2014) *	- (- as sole advisor)

*counted 1 if sole advisor, 0.5 if co-advised

Table 2. Course schedule by semester in ECE since 2009; number of students indicated.

Course	F 09	S 10	F 10	S 11	F 11	S 12	F 12	S 13	F 13	S 14
EE599 (USC)	19				11					
EE464 (USC)			32/48							
EE568 (USC)						12				
EE313								54	56	
EE381V										9

UNIVERSITY OF TEXAS AT AUSTIN
UT ECE
ELECTRICAL & COMPUTER ENGINEERING

THE DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

May 1, 2013

Teaching Evaluation for Alex Dimakis:

On Tuesday April 30th, 2013, I observed Alex Dimakis teach EE313 – Systems and Signals. In this class, Alex discussed signal sampling and reconstruction. The first part of the class as spent developing motivation and intuition for the problem. He described why the problem is important, why it is hard, and also gave real world applications. Also, something I found quite effective, was that he began the class with some of the history of the problem.

Generally EE313 is one of our more mathematically oriented and abstract (undergraduate) classes. Explaining the importance and general motivation, in addition to the technical details which of course are the heart of the matter, is important for keeping the students engaged, and also to help with the higher level understanding of the material, rather than just the manipulations and calculations required. Alex seemed quite effective on both these fronts. I summarize some of the main reasons he was able to do this.

(a) Mastery of the technical material. Alex displayed a complete mastery and facility with the technical material – what was being taught, but more generally as well. The students seem to respond to this quite well. In fact, towards the end of the class, Alex devoted some time to discussing some sampling-related problems that are of active research interest. The students seemed to like this quite a bit, and indeed it was an exciting part of the class.

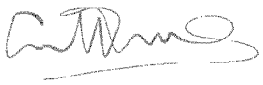
(b) Connection with past homework problems. In his discussion throughout the class, Alex repeatedly referred to past homework, matlab experiments and exam problems, therefore linking the material of the current class, to past material the students had worked with.

(c) Progress towards the solution. In his class discussion, Alex used a deductive approach which engaged the students, encouraged them to contribute to the class discussion, and also kept them actively thinking as he moved closer to the solution. For example, in discussion of signal reconstruction from sampling, he put out the strawman of reconstructing using splines, which was then discussed as a potential way forward, before realizing that it's not the best way to rebuild the signal.

(d) More generally, Alex has what I would describe as a high energy, very engaging and very effective rapport with the students. This was immediately apparent from the moment he walked into the class. High energy seems to be his secret here. This certainly must have helped in keeping the students paying attention, focused, and generally eager to contribute and answer the questions he asks the class.

(e) Board work. Alex made effective use of the overhead projector – he hand-writes the lecture on paper, which is then projected. This is a technique that seems to work well for Alex, and has the side benefit of creating a record of what was covered in the class.

These are the main techniques that I observed in class, and they all gave me the clear sense that Alex is an effective classroom teacher.



Constantine Caramanis
Associate Professor
The University of Texas, Austin

[redacted]

Faculty Member Observed ____Dimakis A._____ Rank __Assistant Prof.__

Date of Observation _____4/10/14_____ Course Observed __EE381V ADV CODING_

	Not Applicable	*Needs Improvement*	*Done Well*	*Truly Exemplary*
CONTENT				
1. Presented main ideas clearly	NA	NI	DW	TE
2. Provided variety of supporting information	NA	NI	DW	TE
3. Clearly addressed relevancy of main ideas	NA	NI	DW	TE
4. Required higher order thinking of students	NA	NI	DW	TE
5. Related ideas to students' prior knowledge	NA	NI	DW	TE
6. Provided definitions for new terms/concepts	NA	NI	DW	TE
ORGANIZATION				
7. Connected introduction to previous classes	NA	NI	DW	TE
8. Stated organization/objectives	NA	NI	DW	TE
9. Used clear, effective transitions with summaries	NA	NI	DW	TE
10. Had a clear and organized plan	NA	NI	DW	TE
11. Concluded by summarizing main ideas	NA	NI	DW	TE
12. Connected to future classes/courses/expectations	NA	NI	DW	TE
INTERACTION				
13. Questioned students at different learning levels	NA	NI	DW	TE
14. Provided sufficient wait time after asking questions	NA	NI	DW	TE
15. Encouraged student questions	NA	NI	DW	TE
16. Gave informative responses to student questions	NA	NI	DW	TE
17. Had a good rapport/engagement with students	NA	NI	DW	TE
VERBAL/NONVERBAL				
18. Was confident and enthusiastic	NA	NI	DW	TE
19. Used clear articulation and pronunciation	NA	NI	DW	TE
20. Avoided verbalized pauses (e.g. er, ah, um, etc.)	NA	NI	DW	TE
21. Spoke extemporaneously	NA	NI	DW	TE
22. Minimized any distracting accent/language	NA	NI	DW	TE
23. Projected voice to be easily heard	NA	NI	DW	TE
24. Used appropriate pace of delivery	NA	NI	DW	TE
25. Made adequate eye contact with students	NA	NI	DW	TE
USE OF MEDIA				
26. Used classroom technology proficiently	NA	NI	DW	TE
27. Made visual aids easy to read	NA	NI	DW	TE
28. Provided effective outline/handouts	NA	NI	DW	TE

OVERALL RATING

Overall, this instructor was *Unsatisfactory* *Satisfactory* *Very Good* *Excellent*

Modified 1/2011/PJD

NARRATIVE RESPONSES

STRENGTHS [e.g. apparent knowledge of curriculum preceding and following the presented material, positive feedback to students, opportunity provided for student questions, pharmacy-relevant examples]:

The instructor gave an outstanding lecture on compressive sensing. The lecture was very well prepared with several steps meant to engage students. There were many questions from the instructor to the students and then from the students to the instructors that established a continuous and high quality dialogue throughout the lecture.

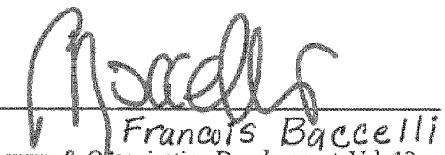
AREAS FOR IMPROVEMENT [e.g. inability to answer student questions, deficiencies in content knowledge, absence of examples/irrelevant examples, difficulties with student rapport, etc.]:

No weakness detected.

ADDITIONAL COMMENTS BEYOND THE LECTURE [e.g. correlation between exam questions and learning objectives, reflection on and incorporation of previous review and suggestions for improvement in teaching, etc.]:

The quality of the lecture is particularly remarkable given that it covered quite recent research topics.

OVERALL: Excellent

Date of Conference 4/10/14 Observer Signature  François Baccelli

Form based on E. Porter, D.K. Meyer & A.S. Hagen. *The Journal of Staff, Program, & Organization Development*, Vol. 12, No. 2, Fall 1994, pp. 104-105.

Modified 1/2011/PJD

DIMAKIS, GEORGIOS-ALEX

Engineering
Electrical Engineering

09/02/14

Summary of Recent (All Years In Rank) UT Austin Course-Instructor Survey Resul
Overall Course/Instructor Items

Semester	Course Number	Course Title	Enrollment		Instructor Averages*		College/School Averages**		
			No. of Students Enrolled on 12th Class Day	No. of Surveys Returned at End of Semester	Overall Instructor Rating Avg.	Overall Course Rating Avg.	Overall Instructor Rating Avg.	Overall Course Rating Avg.	No. Classes Surveyed
Spring 13	E E 313	LINEAR SYSTEMS AND SIGNALS	58	36	4.0	3.5	N/A ***	N/A ***	N/A
Fall 13	E E 313	LINEAR SYSTEMS AND SIGNALS	60	37	4.4	3.8	N/A ***	N/A ***	N/A
Spring 14	E E 381V	ADV CODING	9	9	4.7	4.6	N/A ***	N/A ***	N/A

*For the computation of the averages, points were assigned to student responses as follows:
Excellent = 5, Very Good = 4, Satisfactory = 3, Unsatisfactory = 2, Very Unsatisfactory = 1

**College/school averages are the average of class averages, based on all courses surveyed in the instructor's college or school during the academic year in which the course was taught.

***New CIS forms were implemented in the fall 2000 semester. The average rating on the overall course and instructor questions on the new Basic and Expanded forms have been found to be approximately 0.1 to 0.2 points lower than those ratings on the old Common form.

Prepared by the Measurement and Evaluation Center

UNIVERSITY OF TEXAS AT AUSTIN — COURSE-INSTRUCTOR SURVEY — Spring 2013 DEPARTMENT COPY
Dimakis, Georgios-Alex E 2313 16110 — LINEAR SYSTEMS AND SIGNALS — Enrollment = 54
BCOS Basic — Surveys Returned = 36

	NUMBER CHOOSING EACH RESPONSE					NO. REPLIES THIS ITEM	AVG.
	Str Disag	Disagree	Neutral	Agree	Str Agree		
1 COURSE WELL-ORGANIZED	0	2	6	20	8	36	3.9
2 COMMUNICATED INFORMATION EFFECTIVELY	0	2	6	19	11	36	4.1
3 SHOWED INTEREST IN STUDENT PROGRESS	0	0	4	16	16	36	4.3
4 ASSIGNMENTS AND TESTS RETURNED PROMPTLY	1	5	10	16	4	36	3.5
5 STUDENT FREEDOM OF EXPRESSION	0	0	3	14	19	36	4.4
6 COURSE OF VALUE TO DATE	0	2	8	14	11	35	4.0
	Vry Unsat	Unsat	Satisfac	Very Good	Excellent		
7 OVERALL INSTRUCTOR RATING	0	1	9	16	10	36	4.0
8 OVERALL COURSE RATING	1	3	16	8	7	36	3.5
	Excessive	High	Average	Light	Insuffic		
9 STUDENT RATING OF COURSE WORKLOAD	1	14	18	2	0	35	
	Less 2.00	2.00-2.49	2.50-2.99	3.00-3.49	3.50-4.00		
10 OVERALL UT GRADE POINT AVERAGE	0	1	5	16	14	36	
	A	B	C	D	F		
11 EXPECTED COURSE GRADE	8	19	8	1	0	36	

For the computation of averages, values were assigned on a 5-point scale so that the most favorable response was assigned a value of 5 and the least favorable response was assigned a value of 1.

Scanned: 9/6/2013 Printed: 09/04/2013

UNIVERSITY OF TEXAS AT AUSTIN
Dinakis, Georgios-Alex E E313 16525
8000 Basic

COURSE-INSTRUCTOR SURVEY
LINEAR SYSTEMS AND SIGNALS

Fall 2013 DEPARTMENT COPY
Enrollment = 56
Surveys Returned = 37

	NUMBER CHOOSING EACH RESPONSE					NO. REPLIES THIS ITEM	AVG.
	Str Disag	Disagree	Neutral	Agree	Str Agree		
1 COURSE WELL-ORGANIZED	0	0	3	21	13	37	4.3
2 COMMUNICATED INFORMATION EFFECTIVELY	0	1	3	15	18	37	4.4
3 SHOWED INTEREST IN STUDENT PROGRESS	0	0	2	13	22	37	4.5
4 ASSIGNMENTS AND TESTS RETURNED PROMPTLY	0	0	1	14	22	37	4.6
5 STUDENT FREEDOM OF EXPRESSION	0	0	0	16	21	37	4.6
6 COURSE OF VALUE TO DATE	0	1	6	18	12	37	4.1
	Vry Unsat	Unsat	Satisfact	Very Good	Excellent		
7 OVERALL INSTRUCTOR RATING	0	0	3	17	17	37	4.4
8 OVERALL COURSE RATING	0	1	16	11	9	37	3.8
	Excessive	High	Average	Light	Insuffic		
9 STUDENT RATING OF COURSE WORKLOAD	0	8	25	3	1	37	
	Less 2.00	2.00-2.49	2.50-2.99	3.00-3.49	3.50-4.00		
10 OVERALL UT GRADE POINT AVERAGE	0	2	7	9	19	37	
	A	B	C	D	F		
11 PROBABLE COURSE GRADE	12	22	3	0	0	37	

For the computation of averages, values were assigned on a 5-point scale so that the most favorable response was assigned a value of 5 and the least favorable response was assigned a value of 1.

Scanned: 12/20/2013 Printed: 02/17/2014

Student comments (if available):

UNIVERSITY OF TEXAS AT AUSTIN — COURSE-INSTRUCTOR SURVEY — Spring 2014 DEPARTMENT COPY
Dimakis, Georgios-Alex E E381V 17250 — ADV CODING — Enrollment = 9
8000 Basic — Surveys Returned = 9

	NUMBER CHOOSING EACH RESPONSE					NO. REPLIES THIS ITEM	AVG.
	Str Disag	Disagree	Neutral	Agree	Str Agree		
1 COURSE WELL-ORGANIZED	0	0	2	2	5	9	4.3
2 COMMUNICATED INFORMATION EFFECTIVELY	0	0	0	0	9	9	5.0
3 SHOWED INTEREST IN STUDENT PROGRESS	0	0	1	2	6	9	4.6
4 ASSIGNMENTS AND TESTS RETURNED PROMPTLY	0	0	4	2	3	9	3.9
5 STUDENT FREEDOM OF EXPRESSION	0	0	0	0	9	9	5.0
6 COURSE OF VALUE TO DATE	0	0	0	2	7	9	4.8
	Vry Unsat	Unsat	Satisfact	Very Good	Excellent		
7 OVERALL INSTRUCTOR RATING	0	0	0	3	6	9	4.7
8 OVERALL COURSE RATING	0	0	1	2	6	9	4.6
	Excessive	High	Average	Light	Insuffic		
9 STUDENT RATING OF COURSE WORKLOAD	0	0	7	2	0	9	
	Less 2.00	2.00-2.49	2.50-2.99	3.00-3.49	3.50-4.00		
10 OVERALL UT GRADE POINT AVERAGE	0	0	0	1	8	9	
	A	B	C	D	F		
11 PROBABLE COURSE GRADE	9	0	0	0	0	9	

For the computation of averages, values were assigned on a 5-point scale so that the most favorable response was assigned a value of 5 and the least favorable response was assigned a value of 1.

DEPT: ELECTROPHYSICS | UNIVERSITY OF SOUTHERN CALIFORNIA | EVALUATION SERVICES

INSTRUCTOR: DIMAKIS ,G | 01/20/10

RESPONSES FROM TEACHING EVALUATION - FALL 2009

COURSE: 599

CLASS NUMBER: 30834

NUMBER OF STUDENTS COMPLETING EVALUATIONS: 19
PERCENTAGE OF ENROLLED STUDENTS COMPLETING EVALUATIONS: 100

THE FOLLOWING STATISTICS ARE BASED UPON THE ACTUAL NUMBER OF STUDENTS RESPONDING TO THE QUESTION.

FOR EACH QUESTION, THE PERCENTAGE OF STUDENTS MAKING EACH RESPONSE (OR NOT RESPONDING), THE MEAN RESPONSE, AND THE STANDARD DEVIATION ARE PRESENTED. CAUTION SHOULD BE USED IN INTERPRETING RESULTS WHEN THE TOTAL NUMBER OF STUDENTS COMPLETING EVALUATIONS IS SMALL, THE PERCENTAGE OF ENROLLED STUDENTS COMPLETING EVALUATIONS IS SMALL, OR THE PERCENTAGE OF "NON-RESPONSE" TO INDIVIDUAL ITEMS IS LARGE.

(SOME QUESTIONS HAVE BEEN ABBREVIATED)

SPECIFIC QUESTIONS	NO RESP	POOR (1)	BELOW AVG (2)	AVG (3)	ABOVE AVG (4)	EXCELLENT (5)	MEAN	STD DEV
	---------- PERCENTAGE RESPONDING ----------							
1. CLEARLY ARTICULATED COURSE GOALS.	0	0	11	5	26	58	4.32	1.00
2. ORGANIZED COURSE TO ACHIEVE THOSE GOALS.	0	0	5	16	42	37	4.11	0.88
3. EXPLAINED DIFFICULT CONCEPTS, METHODS, & SUBJ. MATTER.	0	0	0	16	26	58	4.42	0.77
4. ENCOURAGED STUDENTS TO PARTICIPATE IN THEIR LEARNING.	0	0	0	11	37	53	4.42	0.69
5. WAS ACCESSIBLE TO STUDENTS.	0	0	0	11	26	63	4.53	0.70
6. EVALUATED STUDENT WORK IN FAIR & APPROPRIATE WAYS.	5	0	0	21	32	42	4.22	0.81
7. WAS ENTHUSIASTIC ABOUT COMMUNICATING SUBJECT MATTER.	0	0	0	0	21	79	4.79	0.42
8. STIMULATED STUDENT INTEREST IN SUBJECT MATTER.	0	0	0	5	32	63	4.58	0.61
9. PRESENTED SUBJ. MATTER IN ACADEMICALLY CHALLENGING WAYS.	0	0	0	5	21	74	4.68	0.58
10. PROVIDED STUDENTS A VALUABLE LEARNING EXPERIENCE.	0	0	0	11	26	63	4.53	0.70
GENERAL QUESTIONS								
11. OVERALL, HOW WOULD YOU RATE THIS INSTRUCTOR?	0	0	0	11	16	74	4.63	0.68
12. OVERALL, HOW WOULD YOU RATE THIS COURSE?	0	0	0	11	32	58	4.47	0.70
SCHOOL OF ENGINEERING SUPPLEMENTAL QUESTIONS								
13. THE INSTRUCTOR PROVIDED A GOOD PLAN FOR THE COURSE.	0	0	16	0	42	42	4.11	1.05
14. PREREQUISITES FOR THE COURSE WERE ADEQUATE.	0	0	5	11	37	47	4.26	0.87
15. GRADED WORK WAS RETURNED IN A TIMELY FASHION.	5	0	5	21	21	47	4.17	0.99
16. COURSE TOPICS PROGRESSED SYSTEMATICALLY.	0	0	0	11	42	47	4.37	0.68
17. ADEQUATE COORD. BETWEEN THE TA/GRADER & INSTRUCTOR.	16	0	0	26	11	47	4.25	0.93
18. TEXTS & ASSIGNMENTS CONTRIBUTED TO A COHERENT EXPERIENCE.	0	0	0	5	42	53	4.47	0.61
QUESTIONS PROVIDED BY INSTRUCTOR								
19. INSTRUCTOR PROVIDED QUESTION # 19	0	0	0	0	0	0	.	.
20. INSTRUCTOR PROVIDED QUESTION # 20	0	0	0	0	0	0	.	.
21. INSTRUCTOR PROVIDED QUESTION # 21	0	0	0	0	0	0	.	.
22. INSTRUCTOR PROVIDED QUESTION # 22	0	0	0	0	0	0	.	.
23. INSTRUCTOR PROVIDED QUESTION # 23	0	0	0	0	0	0	.	.
24. INSTRUCTOR PROVIDED QUESTION # 24	0	0	0	0	0	0	.	.
25. INSTRUCTOR PROVIDED QUESTION # 25	0	0	0	0	0	0	.	.

DUE TO ROUNDING, PERCENTAGES MAY NOT ADD TO 100.

DEPT: ELECTROPHYSICS

UNIVERSITY OF SOUTHERN CALIFORNIA

EVALUATION SERVICES

INSTRUCTOR: DIMAKIS ,G

01/03/11

COURSE: 464

RESPONSES FROM TEACHING EVALUATION - FALL 2010

CLASS NUMBER: 31395

NUMBER OF STUDENTS COMPLETING EVALUATIONS: 20
PERCENTAGE OF ENROLLED STUDENTS COMPLETING EVALUATIONS: 63

THE FOLLOWING STATISTICS ARE BASED UPON THE ACTUAL NUMBER OF STUDENTS RESPONDING TO THE QUESTION.

FOR EACH QUESTION, THE PERCENTAGE OF STUDENTS MAKING EACH RESPONSE (OR NOT RESPONDING), THE MEAN RESPONSE, AND THE STANDARD DEVIATION ARE PRESENTED. CAUTION SHOULD BE USED IN INTERPRETING RESULTS WHEN THE TOTAL NUMBER OF STUDENTS COMPLETING EVALUATIONS IS SMALL, THE PERCENTAGE OF ENROLLED STUDENTS COMPLETING EVALUATIONS IS SMALL, OR THE PERCENTAGE OF "NON-RESPONSE" TO INDIVIDUAL ITEMS IS LARGE.

(SOME QUESTIONS HAVE BEEN ABBREVIATED)

SPECIFIC QUESTIONS	NO RESP	POOR (1)	BELOW AVG (2)	AVG (3)	ABOVE AVG (4)	EXCELLENT (5)	MEAN	STD DEV
	---------- PERCENTAGE RESPONDING ----------							
1. CLEARLY ARTICULATED COURSE GOALS.	0	0	0	10	35	55	4.45	0.69
3. ORGANIZED COURSE TO ACHIEVE THOSE GOALS.	0	0	0	10	40	50	4.40	0.66
3. EXPLAINED DIFFICULT CONCEPTS, METHODS, & SUBJ. MATTER.	0	0	0	20	15	65	4.45	0.83
4. ENCOURAGED STUDENTS TO PARTICIPATE IN THEIR LEARNING.	5	0	5	20	35	45	4.16	0.96
5. WAS ACCESSIBLE TO STUDENTS.	0	0	0	25	20	55	4.30	0.86
6. EVALUATED STUDENT WORK IN FAIR & APPROPRIATE WAYS.	0	0	0	10	25	65	4.55	0.69
7. WAS ENTHUSIASTIC ABOUT COMMUNICATING SUBJECT MATTER.	0	0	0	5	15	80	4.75	0.55
8. STIMULATED STUDENT INTEREST IN SUBJECT MATTER.	0	0	0	15	35	60	4.45	0.76
9. PRESENTED SUBJ. MATTER IN ACADEMICALLY CHALLENGING WAYS.	0	0	0	25	35	40	4.15	0.81
10. PROVIDED STUDENTS A VALUABLE LEARNING EXPERIENCE.	0	0	0	10	50	40	4.30	0.66
GENERAL QUESTIONS								
11. OVERALL, HOW WOULD YOU RATE THIS INSTRUCTOR?	0	0	0	5	40	55	4.50	0.61
12. OVERALL, HOW WOULD YOU RATE THIS COURSE?	0	0	5	15	50	30	4.05	0.83
SCHOOL OF ENGINEERING SUPPLEMENTAL QUESTIONS								
13. THE INSTRUCTOR PROVIDED A GOOD PLAN FOR THE COURSE.	0	0	0	15	60	25	4.10	0.64
14. PREREQUISITES FOR THE COURSE WERE ADEQUATE.	10	0	0	30	35	35	3.94	0.80
15. GRADED WORK WAS RETURNED IN A TIMELY FASHION.	0	0	5	35	40	20	3.75	0.85
16. COURSE TOPICS PROGRESSED SYSTEMATICALLY.	5	0	0	20	35	40	4.21	0.79
17. ADEQUATE COORD. BETWEEN THE TA/GRADER & INSTRUCTOR.	5	0	5	20	35	35	4.05	0.91
18. TEXTS & ASSIGNMENTS CONTRIBUTED TO A COHERENT EXPERIENCE.	5	5	0	30	30	30	3.84	1.07
QUESTIONS PROVIDED BY INSTRUCTOR								
19. INSTRUCTOR PROVIDED QUESTION # 19	0	0	0	0	0	0	.	.
20. INSTRUCTOR PROVIDED QUESTION # 20	0	0	0	0	0	0	.	.
21. INSTRUCTOR PROVIDED QUESTION # 21	0	0	0	0	0	0	.	.
22. INSTRUCTOR PROVIDED QUESTION # 22	0	0	0	0	0	0	.	.
23. INSTRUCTOR PROVIDED QUESTION # 23	0	0	0	0	0	0	.	.
24. INSTRUCTOR PROVIDED QUESTION # 24	0	0	0	0	0	0	.	.
25. INSTRUCTOR PROVIDED QUESTION # 25	0	0	0	0	0	0	.	.

DUE TO ROUNDING, PERCENTAGES MAY NOT ADD TO 100.

DEPT: ELECTROPHYSICS

UNIVERSITY OF SOUTHERN CALIFORNIA

EVALUATION SERVICES

INSTRUCTOR: DIMAKIS ,G

01/24/12

RESPONSES FROM TEACHING EVALUATION - FALL 2011

COURSE: 599

CLASS NUMBER: 30441

NUMBER OF STUDENTS COMPLETING EVALUATIONS: 10
PERCENTAGE OF ENROLLED STUDENTS COMPLETING EVALUATIONS: 91

THE FOLLOWING STATISTICS ARE BASED UPON THE ACTUAL NUMBER OF STUDENTS RESPONDING TO THE QUESTION.

FOR EACH QUESTION, THE PERCENTAGE OF STUDENTS MAKING EACH RESPONSE (OR NOT RESPONDING), THE MEAN RESPONSE, AND THE STANDARD DEVIATION ARE PRESENTED. CAUTION SHOULD BE USED IN INTERPRETING RESULTS WHEN THE TOTAL NUMBER OF STUDENTS COMPLETING EVALUATIONS IS SMALL, THE PERCENTAGE OF ENROLLED STUDENTS COMPLETING EVALUATIONS IS SMALL, OR THE PERCENTAGE OF "NON-RESPONSE" TO INDIVIDUAL ITEMS IS LARGE.

(SOME QUESTIONS HAVE BEEN ABBREVIATED)

SPECIFIC QUESTIONS	NO RESP	POOR (1)	BELOW AVG (2)	AVG (3)	ABOVE AVG (4)	EXCELLENT (5)	MEAN	STD DEV
PERCENTAGE RESPONDING								
1. CLEARLY ARTICULATED COURSE GOALS.	0	0	0	0	40	60	4.60	0.52
2. ORGANIZED COURSE TO ACHIEVE THOSE GOALS.	0	0	0	0	60	40	4.40	0.52
3. EXPLAINED DIFFICULT CONCEPTS, METHODS, & SUBJ. MATTER.	0	0	0	0	0	100	5.00	.
4. ENCOURAGED STUDENTS TO PARTICIPATE IN THEIR LEARNING.	0	0	0	0	0	100	5.00	.
5. WAS ACCESSIBLE TO STUDENTS.	0	0	0	10	10	80	4.70	0.67
6. EVALUATED STUDENT WORK IN FAIR & APPROPRIATE WAYS.	20	0	0	0	20	60	4.75	0.46
7. WAS ENTHUSIASTIC ABOUT COMMUNICATING SUBJECT MATTER.	0	0	0	0	0	100	5.00	.
8. STIMULATED STUDENT INTEREST IN SUBJECT MATTER.	0	0	0	0	0	100	5.00	.
9. PRESENTED SUBJ. MATTER IN ACADEMICALLY CHALLENGING WAYS.	0	0	0	0	10	90	4.90	0.32
10. PROVIDED STUDENTS A VALUABLE LEARNING EXPERIENCE.	0	0	0	0	10	90	4.90	0.32
GENERAL QUESTIONS								
11. OVERALL, HOW WOULD YOU RATE THIS INSTRUCTOR?	0	0	0	0	20	80	4.80	0.42
12. OVERALL, HOW WOULD YOU RATE THIS COURSE?	0	0	0	0	30	70	4.70	0.48
SCHOOL OF ENGINEERING SUPPLEMENTAL QUESTIONS								
13. THE INSTRUCTOR PROVIDED A GOOD PLAN FOR THE COURSE.	0	0	0	0	30	70	4.70	0.48
14. PREREQUISITES FOR THE COURSE WERE ADEQUATE.	10	0	0	0	30	60	4.67	0.50
15. GRADED WORK WAS RETURNED IN A TIMELY FASHION.	40	0	0	20	20	20	4.00	0.89
16. COURSE TOPICS PROGRESSED SYSTEMATICALLY.	0	0	0	0	50	50	4.50	0.53
17. ADEQUATE COORD. BETWEEN THE TA/GRADER & INSTRUCTOR.	60	0	0	0	20	20	4.50	0.58
18. TEXTS & ASSIGNMENTS CONTRIBUTED TO A COHERENT EXPERIENCE.	10	0	0	10	40	40	4.33	0.71
QUESTIONS PROVIDED BY INSTRUCTOR								
19. INSTRUCTOR PROVIDED QUESTION # 19	0	0	0	0	0	0	.	.
20. INSTRUCTOR PROVIDED QUESTION # 20	0	0	0	0	0	0	.	.
21. INSTRUCTOR PROVIDED QUESTION # 21	0	0	0	0	0	0	.	.
22. INSTRUCTOR PROVIDED QUESTION # 22	0	0	0	0	0	0	.	.
23. INSTRUCTOR PROVIDED QUESTION # 23	0	0	0	0	0	0	.	.
24. INSTRUCTOR PROVIDED QUESTION # 24	0	0	0	0	0	0	.	.
25. INSTRUCTOR PROVIDED QUESTION # 25	0	0	0	0	0	0	.	.

DUE TO ROUNDING, PERCENTAGES MAY NOT ADD TO 100.

DEPT: ELECTROPHYSICS

UNIVERSITY OF SOUTHERN CALIFORNIA

EVALUATION SERVICES

INSTRUCTOR: DIMAKIS ,G

07/02/12

COURSE: 568

RESPONSES FROM TEACHING EVALUATION - SPRING 2012

CLASS NUMBER: 30771

NUMBER OF STUDENTS COMPLETING EVALUATIONS: 10
PERCENTAGE OF ENROLLED STUDENTS COMPLETING EVALUATIONS: 83

THE FOLLOWING STATISTICS ARE BASED UPON THE ACTUAL NUMBER OF STUDENTS RESPONDING TO THE QUESTION.

FOR EACH QUESTION, THE PERCENTAGE OF STUDENTS MAKING EACH RESPONSE (OR NOT RESPONDING), THE MEAN RESPONSE, AND THE STANDARD DEVIATION ARE PRESENTED. CAUTION SHOULD BE USED IN INTERPRETING RESULTS WHEN THE TOTAL NUMBER OF STUDENTS COMPLETING EVALUATIONS IS SMALL, THE PERCENTAGE OF ENROLLED STUDENTS COMPLETING EVALUATIONS IS SMALL, OR THE PERCENTAGE OF "NON-RESPONSE" TO INDIVIDUAL ITEMS IS LARGE.

(SOME QUESTIONS HAVE BEEN ABBREVIATED)

SPECIFIC QUESTIONS	NO RESP	POOR (1)	BELOW AVG (2)	AVG (3)	ABOVE AVG (4)	EXCELLENT (5)	MEAN	STD DEV
	---------- PERCENTAGE RESPONDING ----------							
1. CLEARLY ARTICULATED COURSE GOALS.	0	0	0	40	40	20	3.80	0.79
2. ORGANIZED COURSE TO ACHIEVE THOSE GOALS.	0	0	10	10	60	20	3.90	0.88
3. EXPLAINED DIFFICULT CONCEPTS, METHODS, & SUBJ. MATTER.	0	0	0	10	40	50	4.40	0.70
4. ENCOURAGED STUDENTS TO PARTICIPATE IN THEIR LEARNING.	0	0	10	40	20	30	3.70	1.06
5. WAS ACCESSIBLE TO STUDENTS.	0	0	0	10	40	50	4.40	0.70
6. EVALUATED STUDENT WORK IN FAIR & APPROPRIATE WAYS.	0	0	0	30	10	60	4.30	0.95
7. WAS ENTHUSIASTIC ABOUT COMMUNICATING SUBJECT MATTER.	0	0	0	0	10	90	4.90	0.32
8. STIMULATED STUDENT INTEREST IN SUBJECT MATTER.	0	0	0	10	30	60	4.50	0.71
9. PRESENTED SUBJ. MATTER IN ACADEMICALLY CHALLENGING WAYS.	0	0	0	20	20	60	4.40	0.84
10. PROVIDED STUDENTS A VALUABLE LEARNING EXPERIENCE.	0	0	10	10	40	40	4.10	0.99
GENERAL QUESTIONS								
11. OVERALL, HOW WOULD YOU RATE THIS INSTRUCTOR?	0	0	0	10	40	50	4.40	0.70
12. OVERALL, HOW WOULD YOU RATE THIS COURSE?	0	0	0	0	80	20	4.20	0.42
SCHOOL OF ENGINEERING SUPPLEMENTAL QUESTIONS								
13. THE INSTRUCTOR PROVIDED A GOOD PLAN FOR THE COURSE.	0	0	10	20	70	0	3.60	0.70
14. PREREQUISITES FOR THE COURSE WERE ADEQUATE.	0	0	0	20	30	50	4.30	0.82
15. GRADED WORK WAS RETURNED IN A TIMELY FASHION.	10	0	20	20	40	10	3.44	1.01
16. COURSE TOPICS PROGRESSED SYSTEMATICALLY.	10	0	10	0	60	20	4.00	0.87
17. ADEQUATE COORD. BETWEEN THE TA/GRADER & INSTRUCTOR.	80	0	0	20	0	0	3.00	.
18. TEXTS & ASSIGNMENTS CONTRIBUTED TO A COHERENT EXPERIENCE.	10	0	0	10	70	10	4.00	0.50
QUESTIONS PROVIDED BY INSTRUCTOR		.						
19. INSTRUCTOR PROVIDED QUESTION # 19	0	0	0	0	0	0	.	.
20. INSTRUCTOR PROVIDED QUESTION # 20	0	0	0	0	0	0	.	.
21. INSTRUCTOR PROVIDED QUESTION # 21	0	0	0	0	0	0	.	.
22. INSTRUCTOR PROVIDED QUESTION # 22	0	0	0	0	0	0	.	.
23. INSTRUCTOR PROVIDED QUESTION # 23	0	0	0	0	0	0	.	.
24. INSTRUCTOR PROVIDED QUESTION # 24	0	0	0	0	0	0	.	.
25. INSTRUCTOR PROVIDED QUESTION # 25	0	0	0	0	0	0	.	.

DUE TO ROUNDING, PERCENTAGES MAY NOT ADD TO 100.

THE UNIVERSITY OF TEXAS AT A IN
OFFICE OF GRADUATE STUDIES
COMMITTEE REPORT, MASTERS AND DOCTORAL
FOR DIMAKIS, GEORGIOS-ALEX

NAME	EID	LAST SEM	COMM POSITION	MAST OR DOCT	DEGREE	FIELD	YYS	2ND DEGREE	FIELD	YYS
CHUCRI, SAMER GERGES	sgc556	132	CHAIR	M	M.S.E.	ELECTRICAL AN	20132			
DAS, ABHIK KUMAR	akd473	139	MEMBER	D	PH.D.	ELECTRICAL AN	20139			
MITLIAGKAS, IOANNIS	im4454	149	MEMBER	D						
NETRAPALLI, PRANEETH K.	pkn226	146	MEMBER	D	PH.D.	ELECTRICAL AN	20146			
PAPAILIOPOULOS, DIMITRIOS	dp26726	142	CHAIR	D	PH.D.	ELECTRICAL AN	20142			
SHAH, VIRAG	vbs232	149	MEMBER	D						
SI, HONGBO	sh32964	149	MEMBER	D						
SINGH, SARABJOT	ss52265	149	MEMBER	D						

Postdoctoral Scholars Supervised

Alex Dimakis
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dimakis@austin.utexas.edu

This document identifies the postdoctoral scholars I have supervised.

- Dr. Michael Borokhovich, Ph.D. from the Communication Systems Engineering department, Ben Gurion University, Israel, 2013. Appointment in my group (jointly with S. Vishwanath) 5/2014. Currently, a research scientist in my group.
- Dr. Anastasios Kyrillidis joined UT in Fall 2014 after receiving his PhD from EPFL Switzerland, 10/2014. (Joint with Prof. Caramanis and Prof. Sanghavi.)

Budget Council Assessment of Research, Publications & Other Evidence of Scholarship/Creativity for Alex Dimakis for promotion from Assistant Professor to Associate Professor

Prepared by Budget Council members Gustavo De Veciana and Vijay K Garg

Basis for Evaluation: In preparing this assessment, we have relied upon Dr. Dimakis's curriculum vita, his publications, research statement, comments from respected colleagues at other universities and industry, and on-line research tools for evaluating publication records.

Research Area and Contributions and Research Impact. Dr. Dimakis' primary research interests to date include information and coding theory, machine learning and networking. Below we discuss some of his research contributions, which we believe to be substantial.

He is widely considered one of the inventors of coding theory for distributed data storage. His work in this area is motivated in part by the large distributed storage systems that are the basis of current cloud based applications and services, e.g., Google, Facebook, etc. The use of coding to ensure the reliability of communication and storage systems is a well-researched discipline in which it is challenging to make new contributions. However, in his dissertation, Dr. Dimakis' recognized that *distributed* storage systems introduce new challenges that require rethinking how such data is stored and coded. This is particularly true in large scale systems (most consisting of thousands of storage disks) where the rate of failures is sufficiently high and the overhead for recovering and repairing the coded data becomes a critical concern.

Dr. Dimakis furthered his initial Ph.D. work in this area with a substantial number of publications (10) that address what is theoretically possible as well as the challenges in designing practical codes for use in such systems. His most recent work in this area is with a Ph.D. student, D. Papailiodopoulos who is working under his supervision. Their work focuses on characterizing "locally repairable codes," i.e., codes for distributed storage that could be locally repaired when there are constrained accesses to storage, and thus communication overheads. It can be viewed as a "culmination" of this research program to date, in that it not only characterizes theoretical tradeoffs between locality and fault tolerance, but also offers a direction for practical design of such codes. Dr. Dimakis has not only made several central contributions in this important new area, but has led the research community while reaching out to industry.

The referees concur with this point of view, and offer very positive comments on this body of work and the substantial impact it has had. According to Prof. Ananthram (Professor, Berkeley) this work

"*has set a veritable hailstorm of research: there are already conferences devoted purely to distributed data storage, and there are many groups around the world working on this topic.*"

The main information theory conferences (ISIT, Allerton, ITA) routinely have several sessions on distributed storage that build on this work. Moreover, distributed storage codes have recently been implemented in big data analytics clusters and cloud storage systems. According to Emina Soljanin (Distinguished Member of Technical Staff, Mathematical Sciences Research, Bell Labs),

"*This work and its follow up have already made impact on industrial distributed storage solutions such as the Microsoft's Azure Storage System and the Facebook's Hadoop Distributed File System.*"

Dr. Dimakis has substantially broadened his research focus while in rank. This reflects his growth and development as researcher, as well as ability to participate in and/or lead collaborative efforts. Indeed he has made contributions to several areas including: gossip and message passing algorithms; linear

programming decoding and compressed sensing; distributed caching; and machine learning. Below we highlight two of these contributions.

Dr. Dimakis and his collaborators have established surprising connections between coding theory and compressed sensing. In simple terms, the problem faced in the compressed sensing framework is the recovery of a sparse signal based on a small number of linear measurements of its unknown components. Their work in this area not only resulted in an improvement of performance of Linear Programming (LP) based decoders for binary linear codes, but solved an open problem in providing the first deterministic design of the minimal number of linear measurements required to recover certain classes of sparse signals. Prof. Anantharam (Berkeley) attests to the importance of this work in tying together the active research areas in the field:

"The results in this paper provide a framework within which results in one area can be translated into results in the other area and have led, for instance, to the first explicit constructions of compressed sensing matrices providing the kind of guarantees for sparse recovery from measurements that are the central concern of that field."

Dr. Dimakis has also initiated approximate solutions of large-scale graph analytics problems. His approach approximates quadratic optimization problems with combinatorial constraints by solving low-rank projections of the involved problems. His group has applied this framework in three problems: Sparse PCA, Densest-k-subgraph detection, and nonnegative PCA. In all three cases, they obtain algorithms that can be applied in very large scale and outperform the previous state-of-the-art. This is a very substantial recent line of work that Prof. Tse (Stanford) highlights as follows:

"One recent piece of work that impressed me a lot is his work with his student Dimitris Papailiopoulos on sparse principal component analysis (PCA). The sparse PCA problem is well known NP-hard problem but Papailiopoulos and Dimakis came up with an algorithm for which they were able to give performance guarantees in terms of the spectrum of the data matrix. This allows them to bypass the pessimistic worst-case performance predicted by NP hardness and instead show that their algorithm is polynomial time on a lot of real problems of interest."

Publications: Dr. Dimakis' overall publication record is considered stellar in his discipline. He has published 29 journal papers and 60 conference papers. Of the 29 journal papers, 25 were published in rank and 11 published since his arrival at The University of Texas at Austin in 2013. The majority of these publications are in well regarded IEEE proceedings and transactions, including 13 in IEEE Transactions on Information Theory, which is the most prestigious journal in his area. Of the 60 conference papers, 44 have been published in rank. Eleven of the conference papers are in highly selective conferences such as IEEE IPSN, IEEE INFOCOM and ICML.

His published work is particularly well cited, suggesting that it has had a significant impact on the research community. Indeed, based on Google Scholar, his work has received more than 3000 citations, including nine papers with more than 100 citations each. This is remarkable for a scholar at this stage of his/her career.

Funding: Dr. Dimakis has demonstrated the ability to maintain a sustainable research program. This includes support from varied sources, including both competitive peer-reviewed federal sources and industry awards. While in rank (including the period at the University of Southern California), he has been awarded four National Science Foundation (NSF) grants (including an NSF CAREER Award) on which he is either the sole or principal investigator, an Army Research Office Young Investigator Award (ARO YIP) and a DARPA STTR award in collaboration with Continuum Analytics. He also received a Google Faculty Award and research support from Intel, CISCO and General Motors. Overall, while in rank, he has

contributed towards raising $3.4M of which $1.79M is his share, including two prestigious young investigator awards: the NSF CAREER Award and the ARO YIP Award. We note that a substantial fraction (total of $1.9M of which $837K is his share) of this funding was awarded since joining The University of Texas at Austin 2013: including a multi-university NSF grant, a single PI NSF grant, the ARO YIP Award, and the recruiting of a new industrial affiliate (DOCOMO) for the WNCG research center. Given the primarily theoretical nature of his research work to date this funding track record should be deemed exceptional.

Peer Comparison: For purposes of this promotion evaluation we conducted a peer comparison of Dr. Dimakis' track record with those of three recently tenured professors in similar research areas at top departments. The comparisons are summarized below.

Aaron Wagner received his PhD in 2005 from U.C. Berkeley and joined Cornell in 2006 after a postdoc at UIUC. He was tenured as an Associate Professor at Cornell ECE 2012. He studies problems at the intersection of information theory and other fields including networking, statistics, and learning. His most well known results are in network information theory and specifically in problems involving the compression of distributed sources. Research areas of overlap with Dr. Dimakis include: information theory, distributed information processing, and signal processing.

Adam Wierman received his PhD in 2007 from CMU, and joined the Department of Computing and Mathematical Sciences at Caltech as an Assistant Professor. He was promoted (to a full professor directly, as done in Caltech) in 2012. He studies stochastic modeling, networking, game theory and applications in data centers and energy efficient computing. He has developed scheduling and resource allocation algorithms for data centers and received several awards for his work. Research areas of overlap with Dr. Dimakis include: distributed algorithms, data centers, and networking.

Lizhong Zheng received his Ph.D. degree, in 2002, from the Department of Electrical Engineering and Computer Sciences, U.C. Berkeley. From 2002 to 2008 he was an assistant professor in the Department of Electrical Engineering and Computer Sciences at MIT, where he is currently an Associate Professor. His research interests include information theory, wireless communications and wireless networks. His most well known work is the characterization of a tradeoff between diversity and multiplexing in multiple antenna wireless systems. Research areas of overlap with Dr. Dimakis include: information theory and wireless networks.

The table below gives brief peer comparison of these distinguished faculty. It demonstrates that Dr. Dimakis' research productivity (papers and grants) is better or on par with leading researchers in the field.

Name (Current University)	**Alex Dimakis (UT Austin)**	**Aaron Wagner (Cornell)**	**Adam Wierman (CalTech)**	**Lizhong Zheng (MIT)**
PhD Year (University)	2008 (UC Berkeley)	2005 (UC Berkeley)	2007 (CMU)	2002 (UC Berkeley)
Postdoc (University)	1 year (Caltech)	1 year (UIUC)	None	None
Promotion Year (University)	2015 (UT Austin)	2012 (Cornell)	2012 (CalTech)	2008 (MIT)
Years as Asst. Professor	4.5 (so far) (3.5 at USC, 1 at UT Austin)	6	5	6

Publications (at time of promotion)				
Journal	29	17	17	14
Selective Conference	11	0	21	1
Other Conference	49	34	29	28
Research Citations (present time, from Google Scholar)				
H-index	30	12	24	20
i-100 index	8	1	5	8
Citations	3600	707	1914	5535
Funding				
NSF CAREER in year	2011	2007	2009	2004
Grants (estimate)	4 NSF 1 DOD, 3 Industry	4 NSF 1 Industry	3 NSF 1 Industry	4 NSF 1 DOD

Conclusion: Dr. Dimakis has made groundbreaking contributions in multiple areas. His work has already had significant impact on theory and practice, in both academia and industry. The authors of this Budget Council Assessment agree with the following concluding remarks by very well respected researchers. Prof. Ananthram (Berkeley),

"*In summary I think the case for promotion to tenure is about as clear cut as it could be. Alex is an outstanding, highly productive individual with a wide range of research interests, who is playing a leadership role in some of the most prominent developments in the field.*"

Prof. David Tse (Stanford),

"*Given the originality, depth and breadth of Professor Dimakis' contributions, spanning from theory to practice, I have no doubt that he deserves tenure. The field of information theory needs young people like him who are fearless in exploring new research directions.*"

Prof Vijay Kumar "*he is quite clearly, a "superstar" even at this early age*"

Prof. Kschischang (Canada Research Chair Professor, U. Toronto),

"*Prof. Dimakis is one of the strongest researchers of his generation in information theory and coding.*"

We recommend him in the strongest possible terms for a tenured Associate Professor position at The University of Texas at Austin.

Gustavo de Veciana Vijay Kumar Garg

Gustavo De Veciana **Vijay K Garg**

FIVE SIGNIFICANT PUBLICATIONS

Alex Dimakis
Assistant Professor
University of Texas at Austin

1) D. S. Papailiopoulos, A.G. Dimakis, and V.R. Cadambe, "Repair Optimal Erasure Codes through Hadamard Designs," IEEE Transactions on Information Theory, vol. 59(5), pp. 3021-3037, May 2013.

2) D. Papailiopoulos, A. Dimakis, and S. Korokythakis, "Sparse PCA through Low-rank Approximations," International Conference on Machine Learning (ICML), vol. 28(3), pp. 747-755, 2013.

3) A.G. Dimakis, R. Smarandache, and P.O. Vontobel, "LDPC Codes for Compressed Sensing," IEEE Transactions on Information Theory, vol. 58(5), pp. 3093-3114, May 2012.

4) A.G. Dimakis, P.B. Godfrey, Y. Wu, M.J. Wainwright, and K. Ramchandran, "Network Coding for Distributed Storage Systems," IEEE Transactions on Information Theory, vol. 56(9), pp. 4539-4551, Sept. 2010.

5) M. Sathiamoorthy, M. Asteris, D. Papailiopoulos, A.G. Dimakis, R. Vadali, S. Chen, and D. Borthakur, "XORing Elephants: Novel Erasure Codes for Big Data," Proceedings of the VLDB Endowment, vol. 6(5), pp. 325-336, March 2013.

Research Statement

Alex Dimakis
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In broad terms, I am interested in information theory, coding theory, machine learning, and networking. My research contributions can be classified into six categories as follows:

a) Coding for distributed storage. A significant volume of my work has been on defining and developing the theory of distributed storage codes. This area studies the novel problems that arise when an erasure code is used to protect information that is stored in a distributed way over multiple machines in a data center.

b) Gossip and message passing algorithms. Gossip (or consensus) algorithms are simple message-passing schemes that solve distributed computation problems using local operations. My work has focused on analyzing the convergence time of gossip algorithms that compute linear functions and modifying them to accelerate their time and communication complexity.

c) Linear programming decoding and compressed sensing. Linear programming (LP) decoding is a novel convex relaxation method for decoding binary linear codes. In my work, I focused on improving the performance of the LP decoder by solving additional optimization problems that correspond to guessing the values of some bits. Subsequently, with collaborators, we discovered a connection between LP decoding of binary codes and the basis pursuit LP used in compressed sensing. This work led to the first deterministic designs of compressed sensing matrices with an optimal number of measurements.

d) Distributed caching. Wireless mobile data traffic is expected to increase tremendously, driven mainly by the increase of mobile video traffic. Our work on this topic initiated the idea of using base-stations as caches, essentially pushing the idea of content delivery networks (CDNs) to the edge of wireless networks. This is an active research area that is receiving increasing attention from both industrial and academic research labs.

e) Machine learning. My research group has recently started studying large-scale graph analytics problems by using a novel framework of low-rank approximations that we call the spannogram. The main idea is that we can approximate quadratic optimization problems with combinatorial constraints by solving low-rank projections of the involved problems. We have applied this framework in three problems: Sparse PCA, Densest-k-subgraph detection, and nonnegative PCA. In all three cases, we obtain algorithms that can be applied in very large scale and outperform the previous state-of-the-art.

f) Index coding. Index coding is a combinatorial communication problem that involves a noiseless broadcasting base station and multiple terminals that have side information. The problem has fascinating connections with network coding, interference alignment, and graph theory. In our recent work, we have managed to obtain novel ways of constructing index codes. Furthermore, we discovered a duality connection between index coding and distributed storage codes.

My work has had a significant impact on my research field. This is partially evidenced by the fact that nine of my papers have received more than hundred citations each ([596, 257, 211, 195, 189, 187, 121, 116, 103] from Google scholar).

Research program sustainability: My research has been supported by industrial affiliates, federal grants and awards: 4 from NSF (including the CAREER), and 2 from DoD, (including a Young Investigator award). The interdisciplinary nature of this research is reflected in the broad range of fields published in the top venues: information theory (Transactions on Information Theory), communication networks (Infocom, IPSN), Data management systems (VLDB), and machine learning (ICML). The research areas of large-scale information storage and processing are rapidly growing due to emerging needs for big data analytics. These growing business and technology trends suggest that funding to support this research agenda is expected to continue for the foreseeable future.

The citations below are cross-referenced with my resume; all papers listed are also available from my web page: http://users.ece.utexas.edu/~dimakis

a) Coding for Distributed Storage: My dissertation work initiated the information theoretic study of the area that is now called *coding for distributed storage* or *regenerating codes*. The important realization was that when information is stored in a distributed manner across multiple machines, new *communication* problems arise in maintaining the code redundancy.

For a code used in a distributed storage system, we defined *the code repair problem* [J6] as consisting of reconstructing a single lost code symbol at a new location. In [J6] we defined the functional repair problem, where one is allowed to create a new symbol, different from the original lost symbol, as long as the distance (*i.e.*, fault tolerance) of the code is preserved. The important realization is that the functional repair problem is equivalent to a multicasting-network coding problem on a graph we called the information flow graph. Building on the pioneering work of Ahlswede *et al.*, we fully characterized the communication required for functional repair by evaluating minimum cuts on the information flow graph. This cut analysis showed a tradeoff between the amount of information stored in each node and the required repair communication.

The important open problem that was raised by [J6] is if this performance can be achieved for the harder problem of *exact repair*, which is the problem of reconstructing a lost code symbol by communicating as little information as possible from other code symbols. Functional repair is a clear outer bound for this problem (the cut-set bound), but exact repair can be shown to be equivalent to a multi-source network coding problem where multicasting results do not apply. A large body of work by my group and several others has since focused on constructing achievable storage codes and fundamental bounds for exact repair.

It is currently known that the exact repair region is different from the cut-set region computed in [J6], but the two extremal tradeoff points (minimum storage and minimum repair bandwidth) match. One important contribution was identifying that interference alignment is a critical ingredient in the design of distributed storage codes [C19]. Subsequent work by my research group [J10, J19, J25, J26] has focused on explicit designs of storage codes that are optimal for exact repair.

A more recent contribution was the definition of a new repair-cost metric that simplifies the design of practical distributed storage codes. We defined the concept of Locally Repairable Codes (LRCs) that relaxes the communication requirement into simply counting how many code symbols are involved in the reconstruction of a lost symbol. In our work [C37, C52, J22, J29] we identified an information theoretic tradeoff between locality and minimum distance, and designed optimal codes that match it.

This work has had a significant academic impact. This is partially evidenced by the number of citations of the papers [J6, J10, C19, J19, J29] from Google scholar [596, 187, 116, 48, 56]. Furthermore, [J6] received the Information Theory Society and ComSoc 2012 joint paper award.

a.2) Application in Real Distributed Storage Systems: Beyond academic impact, I am very interested in the practical application of these new codes in real systems. My group has collaborated with Microsoft Research [C35] and Facebook [J19] on the design of practical storage codes. In our work [J19] we designed and implemented a locally repairable code into the Hadoop Distributed File System and measured several performance metrics in clusters in Amazon and Facebook. Our work, in collaboration with Facebook researchers, has impacted the design of HDFS RAID, the open source Hadoop component that implements erasure coding and is used in Facebook clusters (storing more than 30 Petabytes of data).

In parallel to our work, Microsoft researchers used similar ideas to design a family of codes with repair locality, and they implemented them in production clusters in Windows Azure Storage. As reported by Microsoft researchers, their distributed storage codes had a significant impact in their data center efficiency.

b) Gossip and Message-Passing Algorithms: Gossip (or average consensus) algorithms, are simple message-passing schemes that solve distributed computation problems by using localized and non-coordinated computations. One prototypical example is the problem of computing the average of n nodes in a distributed way. This problem, its connections to the spectrum of stochastic matrices, and mixing of Markov chains has been studied for over thirty years.

In my work, I investigated how to analyze and accelerate the convergence rate of gossip algorithms under different topology and knowledge assumptions [J3, J7, J8]. One significant result was the first gossip algorithm [J3] that computes linear functions in an optimal number of messages (linear in n) for many planar topologies by exploiting location information. This area is summarized in our recent survey paper [J8].

c) Linear Programming Decoding and Compressed Sensing: Linear programming (LP) decoding is a novel convex relaxation for decoding binary linear codes that was introduced by Feldman, Wainwright, and Karger, and independently by Vontobel and Koetter. Our early research on this topic focused on improving the performance of the LP decoder by solving additional optimization problems that correspond to guessing the values of some bits [J5]. Furthermore, we were able to analyze the performance of LP decoding under random errors and prove that a significant fraction of errors can be corrected in polynomial time [J4].

Subsequently, in collaboration with P. Vontobel and R. Smarandache, we discovered a connection between LP decoding of binary codes and the basis pursuit LP relaxation used in compressed sensing [J15]. Sparse approximation and compressed sensing problems involve recovering an unknown sparse signal of length n, after observing a few linear measurements of its unknown components. Celebrated compressed sensing results by Candes *et al.*, and Donoho, established that randomly constructed matrices will be sufficient with high probability. However, *verifying* that a given matrix realization can indeed recover all sparse signals requires exponential computational complexity. An open problem in sparse approximation theory is the *deterministic* construction of such optimal matrices so that this verification step is not required. There are several deterministic constructions in the literature, but all require a sub-optimal scaling in the number of required measurements.

In our work [J15, C32] we were able to solve this open problem for recovering almost all k-sparse signals. The main technical result connects the nullspace of any (0,1)-valued compressed-sensing measurement matrix A, with the fundamental polytope of the corresponding LDPC code defined by A. Note that the nullspace is computed over the real field, but the LDPC code is created by treating A as a parity-check matrix over GF(2). Interestingly, we show that points from one domain imply the existence of points in the other and further the success of LP decoding and compressed sensing that requires a near-identical condition: that there are no nullspace/fundamental polytope points, with most of their l1 mass concentrated in a few coordinates.

Our work allowed us to leverage results from LP decoding of LDPC codes to construct provably good deterministic compressed-sensing matrices. Specifically, we were able to obtain the first deterministic designs of compressed-sensing matrices with an order-optimal number of measurements [J15, C32] that can provably recover almost all k-sparse signals under basis pursuit decoding.

d) Distributed Caching: A recent thread of my research work has focused on understanding how wireless network architectures can benefit from the use of distributed storage. Wireless mobile data traffic is expected to increase by a factor of *40* over the next five years, according to projections by Cisco. This explosive demand is fueled mainly by mobile video traffic that is expected to increase by a factor of *65* times, and become the dominant source of data traffic.

In an on-going project, we show that caching popular content at the base stations can lead to tremendous capacity gains for certain kinds of traffic [C36, J23]. There are several interesting questions on the development of caching algorithms that exploit base-station storage to reduce the backhaul bottlenecks of small-cell wireless networks. Pushing this idea even further, we have investigated the role of caching at mobile devices to utilize device-to-device collaboration [J20, J28, J27].

One indication of impact for this work is the number of citations of [C36] from Google scholar, which is 72 since 2012. This project is funded in part by Cisco and Intel who have showed substantial interest in implementing these ideas in real systems.

e) Machine Learning: Several problems in machine learning, data mining and graph theory can be expressed as quadratic maximization problems, subject to integrality, positivity, or sparsity constraints. These include Sparse PCA, Densest Subgraph, Nonnegative matrix factorization, MaxCut, Maximum clique and many others. These problems are known to be computationally intractable and, in many cases, hard to approximate.

Building on the foundational work of Karystinos *et al.*, we are developing a novel technique that can solve these problems *exactly when the involved quadratic form matrix is positive semidefinite and low rank, even under combinatorial constraints*. This is achieved by transforming the low-rank space using hyperspherical coordinates in a method we call the *spannogram*, which allows us to handle constraints like integrality or sparsity.

Clearly, real-world data sets rarely produce exactly low-rank matrices. For that reason, we obtain low-rank approximations and performance bounds that depend on the spectral decay of the data matrix eigenvalues. We are developing a general framework by combining low-rank approximations with low-rank quadratic optimization. For some problems, we obtain excellent data-dependent bounds and algorithms that outperform the previous state of the art [C54, C59, C60]. These papers have been accepted to the highly selective International Conference on Machine Learning (ICML).

In our work for finding dense subgraphs we implemented a distributed version of our algorithm using the MapReduce framework, scaling up to 800 cores on Amazon EC2. This allowed us to find dense clusters in massive graphs with billions of edges [C59].

My research group recently received a DARPA STTR grant jointly with Continuum Analytics, an Austin-based company, to explore parallel implementations of spannogram-type algorithms over GPUs.

f) Index Coding: Index coding is a noiseless broadcasting problem with receiver side information. It is very simple to describe, and was introduced by Birk and Kol, motivated by a satellite broadcasting application. Despite this initial simplicity, the problem has been proven tremendously challenging and theoretically deep. Bar-Yossef *et al.*, studied the problem graph theoretically and showed that the scalar linear optimal solution is related to a rank minimization problem over a finite field. It turns out that (for a given field size) scalar linear index coding is equivalent to the graph theoretic quantity *minrank*, that was introduced by Haemers in 1978 to obtain a bound for the zero-error Shannon graph capacity. It is known that finding the length of the optimal scalar linear index code is computationally intractable to find and hard to approximate.

Interest in index coding is increasing, possibly due to two recent developments: 1) It was recently shown that any arbitrary network coding problem with potentially multiple sources and receivers can be mapped to a properly constructed index coding instance. Therefore, statements about index coding can be translated to constructions or bounds for general networks, showing the surprising expressiveness of the problem. 2) Deep connections between interference alignment and index coding are being discovered, bringing an arsenal of new techniques for index code constructions.

Recently, my research group has obtained two results for index coding. The first result, in collaboration with M. Langberg, [C56] involves the construction of achievable schemes (*i.e.*, index codes) and some scaling results on their performance. Specifically, we obtain novel index coding schemes and show they provably outperform all previously known graph theoretic bounds. Furthermore, we establish a rather strong negative result: all known graph theoretic bounds are within a logarithmic factor from the chromatic number. This is in striking contrast to *minrank*, since prior work has shown that it can outperform the chromatic number by a polynomial factor. The conclusion is an interesting dichotomy in behavior of graph theoretic versus algebraic methods of constructing index codes.

Our second result [C58] is a duality connection between linear index coding and Locally Repairable Codes (LRCs). Specifically, we show that a natural extension of LRCs called Generalized Locally Repairable Codes (GLCRs) are exactly dual to linear index codes. In a GLRC, every node is decodable from a specific set of other nodes, and these sets induce a recoverability directed graph. We show that the dual linear subspace of a GLRC is a solution to an index coding instance where the side information graph is this GLRC recoverability graph. We show that the GLRC rate is equivalent to the complementary index coding rate, *i.e.*, the number of transmissions saved by coding. We use this duality to establish a new upper bound for the multiple unicast network coding problem. We believe that our bound could lead to a logarithmic approximation factor for multiple unicast network coding, if a plausible connection is verified.

Summary of Research Outcomes

Peer Reviewed Publications

29 Refereed archival journal publications (25 in rank)
11 Publications in highly selective conferences (IPSN, Infocom, ICML) (7 in rank)
49 Publications in other peer-reviewed conferences (ISIT, Allerton, ICASSP, Globecom, ICC) (44 in rank)

Student Supervision

PhDs graduated: 2 (1 solely advised) PhDs in progress: 6 (3 solely advised)

Terminal MS graduated: 4 (4 solely advised)

External Funding

(Please see table in summary section for details of my in-rank grants)

My research is funded by a wide variety of sources. I have received four NSF grants (all of which I am the sole or one of the Primary PIs). I was recently awarded a Young Investigator Award from ARO and a DARPA STTR award in collaboration with an Austin data analytics company (Continuum Analytics).

Two of the grants above – the NSF CAREER and the ARO Young Investigator – are honorific awards, and typically more competitive than regular grants.

I will continue to regularly interact and participate in these agencies as a PI and as a reviewer, panelist, workshop speaker, etc.

Finally, the WNCG Affiliates program supports my interactions with industry.

Five Significant Publications

1) D. S. Papailiopoulos, A.G. Dimakis, and V.R. Cadambe, "Repair Optimal Erasure Codes through Hadamard Designs," IEEE Transactions on Information Theory, vol. 59(5), pp. 3021-3037, May 2013.
2) D. Papailiopoulos, A. Dimakis, and S. Korokythakis, "Sparse PCA through Low-rank Approximations," International Conference on Machine Learning (ICML), vol. 28(3), pp. 747-755, 2013.
3) A.G. Dimakis, R. Smarandache, and P.O. Vontobel, "LDPC Codes for Compressed Sensing," IEEE Transactions on Information Theory, vol. 58(5), pp. 3093-3114, May 2012.
4) A.G. Dimakis, P.B. Godfrey, Y. Wu, M.J. Wainwright, and K. Ramchandran, "Network Coding for Distributed Storage Systems," IEEE Transactions on Information Theory, vol. 56(9), pp. 4539-4551, Sept. 2010.
5) M. Sathiamoorthy, M. Asteris, D. Papailiopoulos, A.G. Dimakis, R. Vadali, S. Chen, and D. Borthakur, "XORing Elephants: Novel Erasure Codes for Big Data," Proceedings of the VLDB Endowment, vol. 6(5), pp. 325-336, March 2013.

Candidate's Statement on Research

Table 1. Research Summary

Metric	Value
Peer-Reviewed Journal Publications in Rank	25
Peer Reviewed Conference Proceedings Publications in Rank	44
Total Citations of all Publications (Google Scholar)	3600
h-index (Google Scholar)	30
Research Funding Raised ($) (Candidate Share)	$3,444,279 ($1,792,500)
Total Grants/Contracts Received	11
PI on Grants/Contracts Received	8

Table 2. Grants and Contracts Awarded while in Rank

Co-Investigators	Title	Agency	Grant Total	Grant Period
Krishnamachari (USC) (Dimakis Co-PI)	Efficient Storage in Vehicular Networks, (Research contract with USC)	General Motors	$ 98,000 ($ 39,000)	09/2010-9/2011
(none) (Dimakis PI)	CAREER: Network Coding Theory for Distributed Storage	National Science Foundation (NSF)	$ 470,000 ($ 470,000)	2/2011-1/2016
Caire, Molisch (USC) (Dimakis Co-PI)	D2D Wireless Video: Breaking the Cellular Capacity Bottleneck for Efficient Video Delivery	Intel and Cisco	$ 300,000 ($ 100,000)	1/2011-1/2014
Krishnamachari (USC) (Dimakis Co-PI)	Cloud Content Management in Vehicular Networks, (Research contract with USC)	General Motors	$ 100,000 ($ 50,000)	10/2011-9/2012
Ramchandran (UC Berkeley) (Dimakis PI)	Workshop Proposal: Communication Theory and Signal Processing in the Cloud Era	National Science Foundation (NSF)	$ 39,279 ($ 19,500)	06/2012
(none) (Dimakis PI)	Coding for Big Data	Google Faculty Research Award	$ 60,000 ($ 60,000)	7/2012
Pfister (Texas A&M, PI) (Dimakis, UT, PI)	CIF: Small: Collaborative Research: Design and Analysis of Novel Compressed Sensing Algorithms via Connections with Coding Theory	National Science Foundation (NSF)	$ 470,000 ($ 217,000)	9/2012-8/2015

joint with Continuum Analytics (Dimakis PI)	Data-Parallel Analytics on Graphics Processing Units (GPUs)	DARPA STTR Grant	$ 100,000 ($ 30,000)	06/2014 - 11/2014
Viswanath (UIUC, Lead PI), Ramchandran (UC Berkeley, PI) Muriel Medard (MIT, PI) Hajek (UIUC, Co-PI) Srikant (UIUC, Co-PI) (Dimakis, UT, PI)	CIF: Medium: Collaborative Research: Content Delivery over Heterogeneous Networks: Fundamental Limits and Distributed Algorithms	National Science Foundation (NSF)	$ 1,200,000 ($ 200,000)	8/2014 - 8/2017
(none) (Dimakis PI)	YIP: Learning Network Properties through Low Rank Approximations	Army Research Office (ARO)	$ 150,000 ($ 150,000)	09/2014 - 08/2017
(none) (Dimakis PI)	CIF: Small: Sparsity in Quadratic Optimization through Low-Rank Approximations	National Science Foundation (NSF)	$ 425,000 ($ 425,000)	09/01/2014 - 08/31/2017
(none)	WNCG Affiliates Program + Small research gifts	Several industrial affiliates	$ 32,000 ($ 32,000)	2009-2013
		Total	$3,444,279	
		My Share	($1,792,500)	

Division of Labor- Research Projects

Alex Dimakis
Department of Electrical and Computer Engineering, The University of Texas at Austin
dimakis@austin.utexas.edu

This document identifies the division of labor for research projects/grants while in rank. Only collaborative research projects are listed.

Co-Investigators	Division of Labor	Title	Agency	Grant Total	Grant Share	Grant Period
Krishnamachari (PI), Dimakis (Co-PI)	BK 50% effort AGD 50% effort	Efficient Storage in Vehicular Networks, (Research contract with USC)	General Motors	$98,000	$39,000	09/2010-9/2011
Caire (PI), Molisch (Co-PI), Dimakis (Co-PI)	GC 34% effort AFM 33% effort AGD 33% effort	D2D Wireless Video: Breaking the Cellular Capacity Bottleneck for Efficient Video Delivery	Intel and Cisco	$300,000	$100,000	1/2011-1/2014
Krishnamachari (PI), Dimakis (Co-PI)	BK 50% effort AGD 50% effort	Cloud Content Management in Vehicular Networks, (Research contract with USC)	General Motors	$100,000	$50,000	10/2011-9/2012
Ramchandran (PI), Dimakis (PI)	KR 50% effort AGD 50% effort	Workshop Proposal: Communication Theory and Signal Processing in the Cloud Era	National Science Foundation (NSF)	$39,279	$19,500	6/2012
Pfister (PI), Dimakis (PI)	HP 50% effort AGD 50% effort	CIF: Small: Collaborative Research: Design and Analysis of Novel Compressed Sensing Algorithms via Connections with Coding Theory	National Science Foundation (NSF)	$470,000	$217,000	9/2012-8/2015
Viswanath (PI), Hajek (Co-PI), Srikant (Co-PI), Ramchandran (PI), Medard (PI), Dimakis (PI)	AGD 17% effort, rest of team 83% effort	CIF: Medium: Collaborative Research: Content Delivery over Heterogeneous Networks: Fundamental Limits and Distributed Algorithms	National Science Foundation (NSF)	$1,200,000	$200,000	8/2014-8/2017

Budget Council Assessment on Academic Advising, Counseling and other Student Services for Promotion Candidate Alex Dimakis

This statement was prepared by Electrical and Computer Engineering Budget Council members Jeffrey Andrews and David Pan.

Graduate and Research Advising

Prof. Dimakis has graduated two PhD students (one co-advised) in his time as an Asst. Professor. One of them (Dimitrios Papailiopouplos) graduated this spring (May 2014) under his sole supervision at UT Austin, and is considered one of our finest PhD graduates this year, if not over the last several years. He was in considerable demand, and has joined UC Berkeley as a postdoc. We expect to see him in a prestigious faculty position within 2-3 years. The other student completed his PhD at USC and joined Google.

He also has supervised several M.S. students at both USC and UT Austin. One of them (Negin Golrezaei) was doing great work with Alex at USC and they developed important research results on content (e.g., video) caching at the network edge. The publication of that work has gotten a great deal of visibility and has even been commercially adopted in some small cells. We raise this issue to highlight the quality of his advising, which in this case was for a pre-MS student. Negin decided to switch fields entirely (into the business school) when Alex left for UT Austin but she was well on her way to a very strong ECE PhD under his supervision.

Alex also has six current PhD students at UT Austin, two of whom (E. Elenberg and M. Kocaoglu) are joint with Prof. Vishwanath, one (Shanshan Wu) with Prof. Sanghavi, and the other three (E. Lindgren, K. Shanmugam, and M. Asteris) are under his sole supervision. This is an appropriate load for a faculty member like Alex who works deeply on theoretical problems and spends a lot of time with each student. He also is informally advising two PhD students (Taewan Kim and Zhao Song) who may become formal advisees of his by the end of the academic year. In short, he has a very healthy pipeline to future PhD graduates.

Undergraduate Advising

Alex has been very involved with undergraduate advising. We have observed that undergraduate students have an affinity to Alex because of his sense of humor, relentless curiosity and creativity, and his welcoming and friendly nature. This is reflected not only in his stellar teaching evaluations but also in his undergraduate advising record, which we are sure will continue to evolve during his career.

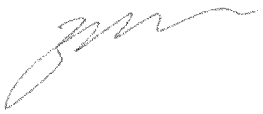
In particular, he has formally supervised a Senior Design team as well as undergraduate research. He has participated in student contests as a mentor and

judge, including a research poster competition this past Spring at UT Austin and a programming contest at USC in 2010. In addition to formal advising, Alex has provided valuable informal mentorship to many of our undergraduates.

Conclusion

Alex Dimakis is an outstanding mentor and advisor, and he is in great demand from students in our program. He works closely and intimately with his advisees and provides them with a great deal of inspiration and guidance. The quantity of his advising is in line with expectations for a person of his rank, and the quality of his advising exceeds expectations for a junior faculty member.

Summary prepared by Budget Council Members



Jeffrey Andrews David Pan

Statement of Academic Advising
Alex Dimakis

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1. Undergraduate Advising

I have supervised and mentored several undergraduate students both within the context of undergraduate research activities as well as student organizations. During 2010, while I was teaching at USC, I acted as advisor for the ACM USC programming contest jointly with David Kempe. The training involved sessions where undergraduate students are given algorithmic problems and need to program their solutions within a limited timeframe. I designed and taught training sessions and also helped in the administration of the programming contests used to select the stronger teams for the next rounds. Having personally participated in such competitions as a high-school and college student, I am a strong supporter since I believe they help creativity and algorithmic thinking, build a team spirit and are quite enjoyable altogether.

After joining UT, during the summer of 2013, I co-supervised Mihir Mongia, an undergraduate student from Rice under the NSF REU EURECA Program (jointly with Sriram Vishwanath). We worked on a large-scale distributed compression problem and our results are currently under preparation for publication. Mihir is currently working as a software engineer and plans to apply for graduate school.

In April 2014 I served as a poster judge for the 2014 PEERS poster exhibition and engineering research symposium organized by the Student Engineering Council (SEC). In this annual poster exhibition competition engineering undergraduates present their research findings in a panel of judges. Prizes were awarded to the top three students from a junior and senior undergraduate category.

I supervised a senior design project team consisting of five ECE undergraduates (Steven Becerra, Megan Germann, Will Hester, Clarke Rahrig and Farzad Yousefi) during the Fall and Spring 2014 semesters. The project was sponsored by Intel and involved the design of a cognitive smartphone configurator that learns user habits and automates tasks. The students implemented an Android application that logs smartphone activities and predicts user activity based on location, time and other collected data supported by a machine learning algorithm.

2. Graduate and Post-Graduate Advising

I am currently supervising six Ph.D. students and two postdocs. I spend a significant amount of time with each student and postdoc in my group and I closely monitor their progress and research results. I hold regular weekly 1-hour meetings with each group member and significant additional time when deadlines approach. I also encourage my students to interact and collaborate with other students within WNCG and through class projects.

PhD Supervisions Completed

- Maheswaran Sathiamoorthy (co-supervised with B. Krishnamachari, USC) - Graduated in December 2013 from USC. Joined Google as a software engineer in the infrastructure team.
- Dimitrios Papailiopoulos - Graduated in May 2014 from UT Austin. Joined UC Berkeley as a postdoctoral researcher working with K. Ramchandran and B. Recht.

M.S. Supervisions completed

- Samer Chucri (2012-2013). Graduated from UT Austin. Joined Google.
- Negin Golrezaei (2011-2013) Graduated from USC. Joined USC Business School PhD Program.
- Sarabjot Khangura (2011-2012) Graduated from USC. Joined Startup.
- Yi-Hsuan (Griffey) Kao (2011-2012) Graduated from USC. Joined USC ECE PhD Program.

PhD Supervisions Ongoing:

- Erik Lindgren – Joining UT in Fall 2014.
- Shanshan Wu (co-advised with S. Sanghavi) – Joining UT in Fall 2014.
- Ethan Elenberg (co-advised with S. Vishwanath) – Joined UT in Fall 2012.
- Murat Kocaoglu (joint with S. Vishwanath) – Joined UT in Fall 2013.
- Karthikeyan Shanmugam – Joined USC in 2011. Moved to UT in Fall 2013. Qualifying exam planned for early 2015.
- Megasthenis Asteris – Joined USC in 2011. Moved to UT in Fall 2013. Qualifying exam planned for early 2015.

Postdoctoral Advising

- Michael Borokhovich joined UT in Spring 2014 after receiving his PhD in Ben Gurion University in Israel. (Collaborates with my group and Prof. Vishwanath's group).
- Anastasios Kyrillides joining UT in Fall 2014 after receiving his PhD from EPFL Switzerland. (Joint with Prof. Caramanis and Prof. Sanghavi.)

Candidate's Statement on Advising, Counseling and Other Student Services

Table 1. Summary of Academic Advising

Metric	Value
Student Organizations Advised	1 (ACM)
Undergraduates Supervised	5.5 (5 sole advisor)
PhD Students Completed *	1.5 (1 sole advisor)
MS Students Completed*	4 (4 sole advisor)
PhD Students in Pipeline (as of 09/2014)*	4.5 (3 sole advisor)
MS Students in Pipeline (as of 09/2014)*	- (- sole advisor)

*counted as 1 if sole advisor, 0.5 if co-advised

Table 2. List of Completed Graduate Students under My Supervision

Student	Co-Supervisor	Degree	Start	Dissertation/ MS Thesis	Placement
Dimitris Papailiopoulos	-	PhD	09/2009	05/2014	UC Berkeley (postdoc)
Maheswaran Sathiamoorthy	Krishnamachari (USC)	PhD (from USC)	09/2008	12/2013	Google

Budget Council Assessment of Service to the University and to the Nation, State and Community

Alex Dimakis

Summary

Professor Dimakis's service record is exceptionally strong both within the department and in the broader scientific community. He has been a solid citizen and already has a high national and international profile. In terms of service at all levels, he compares very favorably with colleagues who successfully achieved tenure in our department.

Service to the University

Professor Dimakis has performed significant service to the University since arriving at UT Austin from the University of Southern California in January 2013. His research primarily falls within the "CommNetS" (Communications, Networks, and Systems) area of the department, and his departmental service therefore primarily involves this area's activities. Within the ECE Department, he has served as a member of the ECE Semester Course Evaluation Committee and CommNetS Pre-Qual Screening Committee for 2014, and the CommNets Graduate Admission Committee for 2013 and 2014. Service on the Graduate Admission Committee is a particularly time-consuming commitment, but is of tremendous importance to the department, as the quality of students who enroll in the department's graduate programs profoundly influences the quality and amount of research that can be conducted. The graduate admissions task for the CommNetS area is particularly daunting. 686 students submitted applications for graduate admission in the CommNetS area for Fall 2014, with only ~90 being admitted. Professor Dimakis' involvement in this activity is thus a very significant service contribution in terms of time, effort, and impact.

Professor Dimakis has also been a key participant or leader in a number of activities for the Wireless Networking and Communications Group (WNCG) at UT. In 2013, he served as program chair of the Winedale Workshop, a one-day event organized by UT Austin, Rice University, and Texas A&M on a topic of outstanding current interest in the communications and networking research community. The 2013 Workshop focused on algorithms for big data analytics, an area in which Professor Dimakis is already regarded as a research leader, and attracted more than 200 attendees. He also served on the organizing committee and as an invited speaker for the 2013 Texas Wireless Summit, which brought together industrial and academic leaders addressing technologies and trends for wireless and big data. Finally, Professor Dimakis has been closely involved in the development of the big data subgroup within WNCG, and in this role, has interacted extensively with potential WNCG industrial affiliates.

Service to the Nation, State, and Community

Professor Dimakis is extremely active and visible in the scientific community. Most notably, he has already served on over 15 technical program committees for key conferences in his area (such as ISIT and MobiHoc). He has also chaired an IEEE workshop on Emerging Data Storage Technologies with ICC, 2012, two workshops sponsored by NSF, and a recent high profile workshop co-located with the 2013 Consumer Electronics Show, the world's largest event on consumer electronics.

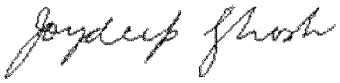
Recently, Professor Dimakis was appointed to the eight member committee that is investigating future directions in information theory. This is a very unusual honor for a junior faculty. He has also served on several funding/review panels at NSF as well as for foreign academic organizations. He currently serves as an associated editor for IEEE Signal Processing Letters, and has reviewed for virtually all the top IEEE journals pertinent to his area.

Basis for Evaluation

This Budget Council assessment of Professor Dimakis' service is based on a thorough evaluation of the materials put together by the candidate for promotion to associate professor, combined with knowledge of the candidate's service activities.

Prepared by Electrical and Computer Engineering Budget Council members

Edward T. Yu 3 August 2014



Joydeep Ghosh 3 August 2014

Service to the University and to the Nation, State and Community

Alex Dimakis
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I have been involved in a number of service activities at USC and UT Austin and also at the national and international level.

1. Service to the University of Texas at Austin

I am serving as a member of three department committees: the ECE Semester Course Evaluation Committee, CommNetS Pre-Qual Screening Committee for 2014, and CommNetS Graduate Admission Committee for 2013 and 2014. Additionally, starting September 2014, I will be co-organizing the Wireless Networking and Communications Group (WNCG) seminar series with E. Nikolova.

In April 2014 I served as a poster judge for the 2014 PEERS poster exhibition and engineering research symposium that was organized by the Student Engineering Council (SEC). In this annual poster exhibition competition, engineering undergraduates present their research findings to a panel of judges. Prizes are awarded to the top three entries from students in the junior-and-senior undergraduate category.

I served as the program chair of the 2013 Winedale workshop, which focused on algorithms for big data analytics. Winedale is a one-day event co-organized by UT Austin, Rice University and Texas A&M. The mission of the event is to facilitate interaction between Texas researchers in the area of signals, systems and communications. The main task of the program chair is to select and invite two distinguished speakers for the event. I invited Sanjeev Arora (Princeton University, Godel Prize, Fulkerson Prize, ACM Fellow) and Piotr Indyk (MIT, Sloan Fellow, Packard Fellow). The event had more than 200 attendees from UT Austin, Rice University and Texas A&M. http://winedale.ece.utexas.edu/2013/

I also served on the organizing committee and as an invited speaker at the Texas Wireless Summit (TWS): http://texaswirelesssummit.com/
TWS is a high profile event (organized by WNCG) that brings industry leaders and academics together to discuss future technologies and trends. This year, the topic was Wireless and Big data. The event was attended by hundreds of people and it was featured in multiple media outlets.

I have been involved in the development of the big data subgroup that was formed within the Wireless Networking and Communications Group. My responsibility involves visiting potential industrial affiliates and maintaining research relations through visits and collaborations.

2. Service to the Nation, State and Community

I have served on numerous technical program committees (more than 15) for conferences in information theory, communications, networking and signal processing. Furthermore, I was the 2013 workshop chair for the IEEE Consumer Communications and Networking Conference (CCNC). The CCNC, sponsored by the IEEE Communications Society, is a major annual international conference. It is co-located with the International Consumer Electronics Show (CES), the world's largest tradeshow for consumer technology, and it attracts hundreds of thousands of visitors.
CCNC is organized with the objective of bringing together communications and networking researchers, developers, and practitioners from academia and industry. The duties of the workshop chair involve reviewing workshop proposals and supervising the technical program committees for paper selections. I was involved in supervising the organization of six workshops involving more than thirty TPC members within the CCNC.

I also served as a symposium co-chair for the Data storage track in the Selected Areas in Communications (SAC) Symposium for IEEE Globecom 2011.

In April 2012, I served as a school lecturer for the European School of Information theory that took place in Antalya, Turkey. Subsequently, I joined the Information Theory School Organizing Committee.

Since January 2014, I have been participating in a committee that is investigating future directions in information theory. This ad-hoc committee was created after IEEE requested that the Information Theory Society identify the key future research directions. The committee consists of nine faculty members, and it includes Jeff Andrews (UT Austin, Chair), Muriel Medard (MIT), Michelle Effros (Caltech) and other leading scholars in communications and information theory. I am one of the two junior members in this committee.

I have served on one NSF panel and one NSF workshop on big data (as an invited speaker and area chair). Furthermore, I have been an external reviewer for funding proposals submitted to the Israeli, Greek, and Hong Kong science foundations. In June 2012, I co-organized (joint with Kannan Ramchandran) a workshop at Berkeley on Communication Theory and Signal Processing in the Cloud Era, funded and attended by an NSF program manager.

I regularly provide peer reviews for the leading journals in my area, including: IEEE Transactions on Information Theory, IEEE Transactions on Signal Processing, IEEE/ACM Transactions on Networking, Random Structures and Algorithms, PNAS and PLOS ONE. Since January 2012, I have been serving as an associate editor for IEEE Signal Processing Letters.

Budget Council Assessment on Honors, Grants and Contracts

This statement on Honors, Grants, and Contracts for Assistant Professor Alex Dimakis was prepared by Budget Council Members Professors Robert Heath and Yale Patt.

In this statement we assess Dr. Dimakis' contributions and credentials in the areas of awards and recognition, exceptional academic and professional merit, and external research funding. Dr. Dimakis has met expectations on honors, grants, and contracts in the Department of Electrical and Computer Engineering for Assistant Professors seeking promotion to Associate Professor with tenure.

Awards, Recognition, and Exceptional Merit

Dr. Dimakis is a recognized leader in the broad area of information theory. He has made important research contributions on a wide variety of topics such as coding for distributed storage, gossip and message passing algorithms, distributed caching, and index coding. He has received prestigious awards for his papers and has been invited to give lectures at important conferences and company sites. We believe that Dr. Dimakis is well positioned to continue making fundamental contributions to information theory and data science in the future. He will be an asset to the ECE Department.

Dr. Dimakis has received a number of awards and recognition. One of his highest visibility awards for his research was based on a paper on distributed storage [J6]. This remarkable paper actually won two awards, the 2010 Communications Society Data Storage best paper award and the 2012 Joint Paper award from the IEEE Information Theory Society and Communications Society. The latter award is very prestigious with only one award being given per year across a wide diversity of journals in the IEEE Communication Society and the IEEE Information Theory Society.

Dr. Dimakis has been recognized through oral presentations, invited lectures, and tutorials in many different venues. For example, he has given talks at several leading information technology companies, including AT&T Research Labs, Facebook, Google, and DoCoMo Innovations. He delivered keynote addresses at the IEEE International Symposium on Network Coding (NetCod), which is a small workshop central to his research area, and at the Workshop on Big Dynamic Distributed Data. He has also given invited talks at important conferences including the Information Theory and Applications Workshop and the Allerton Conference on Communication, Control, and Computing. He has delivered several invited tutorials at very highly regarded international conferences, including the International Conference on Signal Processing and Communications, the European Conference on Wireless Sensor Networks (EWSN), the IEEE International Symposium on Network Coding, and the prestigious IEEE International Symposium on Information Theory (the top conference in his field).

Grants and Contracts

Based on data from Dr. Dimakis' CV, we assess the quality and competitive nature of his grants and contracts. A summary of grants received in rank is provided below.

Sponsor	Title	PIs	Grant Period
General Motors	Efficient Storage in Vehicular Networks, (Research contract with USC)	Krishnamachari (USC) (Dimakis Co-PI)	9/2010-9/2011
National Science Foundation (NSF)	CAREER: Network Coding Theory for Distributed Storage	(none) (Dimakis PI)	2/2011-1/2016
Intel and Cisco	D2D Wireless Video: Breaking the Cellular Capacity Bottleneck for Efficient Video Delivery	Caire, Molisch (USC) (Dimakis Co-PI)	1/2011-1/2014
General Motors	Cloud Content Management in Vehicular Networks, (Research contract with USC)	Krishnamachari (USC) (Dimakis Co-PI)	10/2011-9/2012
National Science Foundation (NSF)	Workshop Proposal: Communication Theory and Signal Processing in the Cloud Era	Ramchandran (UC Berkeley) (Dimakis PI)	6/2012
Google Faculty Research Award	Coding for Big Data	(none) (Dimakis PI)	7/2012-6/2013
National Science Foundation (NSF)	CIF: Small: Collaborative Research: Design and Analysis of Novel Compressed Sensing Algorithms via Connections with Coding Theory	Pfister (Texas A&M) (Dimakis PI)	9/2012-8/2013
DARPA STTR	Data-Parallel Analytics on Graphics Processing Units (GPUs)	joint with Continuum Analytics (Dimakis PI)	6/2014-11/2014
National Science Foundation (NSF)	CIF: Medium: Collaborative Research: Content Delivery over Heterogeneous Networks: Fundamental Limits and Distributed Algorithms	Viswanath (UIUC), Ramchandran (UC Berkeley) Muriel Medard (MIT) Hajek (UIUC)	8/2014-8/2017

Army Research Office (ARO)	YIP: Learning Network Properties through Low Rank Approximations	Srikant (UIUC) (Dimakis PI) (Dimakis PI)	9/2014-9/2017

Dr. Dimakis has received substantial funding from a variety of sources. It is particularly noteworthy that he has received four National Science Foundation (NSF) grants. NSF funding is highly competitive with success rates as low as 10%. He received the prestigious NSF CAREER award, which is a competitive program for untenured faculty. He has also received general NSF funding that was not restricted to untenured faculty. His NSF support shows recognition among both his untenured peers and established researchers in the field.

Dr. Dimakis has also received funding from other government sources, including a DARPA funded STTR (where he is working with a small company) and a prestigious Young Investigator Award from the Army Research Office (ARO). The ARO award is similar to the NSF CAREER award that is made to untenured faculty. Only the best untenured faculty in the US receive both the NSF CAREER award and the ARO Young Investigator Award.

Dr. Dimakis has an impressive variety of funding sources from both government and industry. While the success rates of industry funding are rarely reported, those sources are no less challenging to obtain, especially for faculty early in their careers. His industry support provides clear evidence that Dr. Dimakis' research is valued outside the traditional academic environment. Highlights of his industry support include a joint project funded by Intel and Cisco and a Google research award. The Intel/Cisco award was obtained through a competitive solicitation as part of the Video Aware Wireless Networks program with competition from universities around the world. The Google research award, which supports faculty across several disciplines including Computer Science and Engineering, is open to faculty from any country.

Dr. Dimakis has a good mixture of both single investigator and collaborative proposals. He has served as both the PI and Co-PI on the collaborative proposals, demonstrating his ability to both succeed on his own and to work in teams with other faculty.

Summary

In summary, we believe that Dr. Dimakis has exceeded the bar for honors, grants and contracts. Summary prepared by Budget Council Members Professors Robert Heath and Yale Patt.

Robert Heath

Yale Patt

Honors and Recognition Statement

Alex Dimakis
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I was fortunate to receive a number of awards and other recognition for my research during my years as a faculty member at USC and UT Austin. My research has been quite visible in several communities; primarily information theory, communications and networking.

Research Funding

My research has been supported by a combination of funds from federal agencies and industrial gifts. Four of my grants are from the NSF – I am either the sole or a lead PI on all of them. One of these grants is the NSF CAREER, which I was awarded in February 2011 for my research on "Network Coding Theory for Distributed Storage." This is a five-year award, and was made at an elevated funding level (when compared to the level more common in our research area). In 2012, I was awarded a Google Faculty research award for research on "Coding for Big Data." In addition, I recently received an ARO Young Investigator Award for a research project titled "Learning Network Properties through Low Rank Approximations." These awards were given for different aspects of my research program.

In addition to these grants, I was awarded (as co-PI) research gifts from Intel, Cisco and General Motors as well as industrial affiliate support as a core member of the Wireless Networking and Communications Group (WNCG). More details on these grants can be found in my resume.

Other Honors

One of my research papers [J6] received the 2010 Communications Society (ComSoc) Data Storage best paper award and the 2012 Joint paper award from the IEEE Information theory Society and Communications Society. This paper started the area of coding for distributed storage – a research direction that is currently gaining significant attention.

Program managers and funding agencies recognize the importance of my group's work, and I have been invited to several workshops, panels and review meetings both in the US and abroad. Specifically, I have served on one NSF panel and one NSF workshop on big data (as invited speaker and area chair). Furthermore, I have been an external reviewer for funding proposals submitted to the Israeli, Greek and Hong Kong science foundations. In June 2012, I co-organized (joint with Kannan Ramchandran) a workshop at Berkeley on Communication Theory and Signal Processing in the Cloud Era funded and attended by an NSF program manager.

Invited Talks and Tutorials

I have been invited to give keynote talks and tutorials at the top conferences in my area, organize invited sessions, and give seminars at universities and industrial research labs. My resume contains a detailed list of these activities and dates. The following are some examples:

I was a keynote speaker at the 2010 IEEE International Symposium on Network Coding (NetCod) and at the first workshop on Big Dynamic and Distributed Data (BD3, in conjunction with VLDB 2013). I was also an invited school lecturer at the European school of information theory in April 201, and I gave a (3 hour) tutorial (joint with Kannan Ramchandran) during the 2013 Symposium on Information Theory (ISIT), the flagship conference in my area.

I have presented invited departmental colloquia and seminars at numerous universities and companies including MIT, Stanford, UIUC, Caltech, USC, UCSD, and Texas A&M, Facebook, AT&T, Docomo and Netapp.

Each year I am invited to give talks at two top venues in my area: the Information Theory and Applications (ITA) workshop in San Diego, and the Allerton Conference in UIUC. In addition, I have given one-off invited talks at several venues, including the Conference on Information Sciences and Systems (CISS), the Information Theory Workshop (ITW), the International Symposium on Mathematical Programing (ISMP), a workshop at the Banff Research Station in Banff, Canada, etc.

Chart of External Reviewers
Alexandros Dimakis
Electrical and Computer Engineering Department

Name	Title	Institution	Chosen By Candidate/BC	Date Received	Reason for Declination
RECEIVED					
Venkatachalam Anantharam	Professor, Electrical Engineering and Computer Science Department	University of California -- Berkeley	candidate	7/22/2014	
	Past Associate Editor for the IEEE Communications Theory Society and past Associate Editor for the IEEE Transactions on Information Theory and for the Annals of Applied Probability. He is a Fellow of the IEEE.				
Alexander Barg	Professor, Department of Electrical and Computer Engineering	University of Maryland, Glenn R. Martin Institute of Technology	BC	8/6/2014	
	Research areas are information theory, coding theory, applications of coding in memory and storage systems, and algebraic combinatorics. A fellow of IEEE. A member of technical staff of Mathematical Sciences Research Center of Bell Laboratories, Murray Hill, NJ (prior to 2003).				
Robert Calderbank	Professor, Electrical Engineering and Computer Science Department	Duke University	candidate	7/27/2014	
	Director, Information Initiative at Duke. Former Dean of Natural Sciences at Duke for 3 years. Before joining Duke in 2010, Professor of Electrical Engineering and Mathematics at Princeton University where he also directed the Program in Applied and Computational Mathematics. Before joining Princeton, he was Vice President for Research at AT&T. IEEE Fellow, AT&T Fellow, and member of the National Academy of Engineering. Received the 2013 IEEE Hamming Medal and the 2015 Shannon Award for contributions to coding theory and communications.				
Frank Kschischang	Professor and Canada Research Chair, Department of Electrical and Computer Engineering	University of Toronto	candidate	7/30/2014	
	Research interests are in the area of digital communications, particularly in the area of communication algorithms as used, for example, to decode information transmitted over a noisy channel with an error-correcting code. Fellow of the Royal Society of Canada, Ontario's Premier's Research Excellence Award, Fellow IEEE, IEEE Communications Society and Information Theory Society Joint Paper Award.				
Vijay Kumar	Professor and Chairman, Electrical Communication Engineering	Indian Institute of Science, Bangalore, India and Adjust Research Professor, University of Southern California	BC	8/4/2014	
	Research interests include codes for distributed storage, distributed function computation, coding theory, cooperative wireless communications and wireless sensor networks. IEEE Fellow, Fellow of the Indian National Academy of Engineering.				
Alon Orlitsky	Qualcomm Professor of Information Theory and its Applications	University of California -- San Diego	BC	8/17/2014	
	Research interests include information theory, compression, communication, probability estimation, prediction, machine learning, and speech recognition. Fellow IEEE				

Chart of External Reviewers
Alexandros Dimakis
Electrical and Computer Engineering Department

Emina Soljanin	Distinguished Member of Technical Staff	Mathematical Sciences Research, Bell Labs	BC	7/20/2014	
	Research interests are in the broad area of information and coding theory, and their applications. Projects include designing the first distance enhancing codes to be implemented in commercial magnetic storage devices, first forward error correction for Bell Labs optical transmission devices, color space quantization and color image processing, quantum computation, link error prediction methods for the third generation wireless network standards, and several aspects of secure communications.				
David Tse	Professor, Electrical Engineering Department	Stanford	candidate	8/8/2014	
	Associate Editor, IEEE Transactions on Information Theory (2001-2003), Gilbreath Lectureship from National Academy of Engineering (2012), Co-author (with Pramod Viswanath) of the text "Fundamentals of Wireless Communication," which was used in over 60 institutions around the world.				
Rudiger Urbanke	Professor, School of Computer & Communications Sciences (I&C)	Ecole Polytechnique Federale de Lausanne	BC	7/22/2014	
	Principally interested in the analysis and design of iterative coding schemes, which allow reliable transmission close to theoretical limits at low complexities. Such schemes are part of most modern communications standards, including wireless transmission, optical communication and hard disk storage. His research focuses on the analysis of graphical models and the application of methods from statistical physics to problems in communication. Since 2013 he has been a member of the Board of Information Theory Society as well as Distinguished Speaker. From 2009 to 2012 he was head of the I&C doctoral school and in 2013 he served as Dean a.i. of I&C.				
Raymond Yeung	Choh-Ming Li Professor of Information Engineering and Co-Director of the Institute of Network Coding	The Chinese University of Hong Kong	candidate	7/23/2014	
	Research interests include information theory and network coding. He currently serves as an Editor-at-Large of *Communications in Information Theory* and of *Foundation and trends in Networking.* Fellow of IEEE and the Hong Kong Institution of Engineers.				
DECLINED	none				
NO RESPONSE	none				

COCKRELL SCHOOL OF ENGINEERING
THE UNIVERSITY OF TEXAS AT AUSTIN

Department of Electrical and Computer Engineering • Engineering Science Building
1 University Station C0803 • Austin, Texas 78712-0240 • (512) 471-6179 • Fax (512) 471-3652

June 20, 2014

Dear Dr. Anantharam,

The Department of Electrical and Computer Engineering is considering Alex Dimakis for advancement in rank to the position of Associate Professor at the University of Texas at Austin. We would appreciate your candid assessment of his scholarly contributions to assist our decision-making process. Excellent teaching is an important criterion for promotion, but our evaluation of teaching is being carried out separately, and we are asking you only for information about his scholarly distinction. Copies of Professor Dimakis' curriculum vitae, candidate teaching statement, candidate research statement and several recent papers are posted at the following location: https://www.ece.utexas.edu/promotions/dimakis. You can access the website using the following credentials:

Login name: adimakis01

Password: U3v6C98q

Tenure-track faculty members in our department are normally considered for promotion to associate professor after a probationary period of five full years in rank as assistant professor. Some faculty members who served on the faculty of other institutions prior to joining the University of Texas are considered for promotion to associate professor in less than five years. This is true for Professor Dimakis. As you prepare your review, please consider his career accomplishments as well as his continued performance at the University of Texas at Austin.

We would appreciate your opinions regarding Professor Dimakis' major engineering and/or scientific contributions. In preparing your assessment, please consider the following questions and focus on Professor Dimakis' contributions in rank as an associate professor:

1. Do you know Professor Dimakis, and if so, for how long and under what circumstances?
2. What are the original, innovative, and/or important contributions that he has made in his field of research? Have his publications influenced the thinking of, or the methods used by, others in your field?
3. How would you assess Professor Dimakis' development compared with others in his cohort at research-intensive universities?
4. What is your perspective on Professor Dimakis' promise for further professional growth and leadership?

We would be grateful for any additional comments you might have. The more specific you can be in your comments, the more helpful your evaluation will be.

Under the laws of the State of Texas, Professor Dimakis has the right to request to see any materials in his personnel file, including your letter. Members of our faculty and internal review committees who see your letter as part of the promotion process will hold the comments you make in confidence, however.

For your comments to receive full consideration, we will need to receive a signed letter from you no later than July 28, 2014. It is not necessary for you to send us a hard copy of your letter, an electronic or scanned version with an electronic signature is sufficient. However, we would appreciate receiving a copy that includes your institutional letterhead. In addition, please enclose a copy of a short version of your curriculum vitae or résumé (preferably no longer than two pages) or the URL for your Web site where we may obtain this information. If you have questions, please call me at the number given on the letterhead.

We thank you for your time and assistance with this important matter. As faculty members, we realize that the amount of time required to do a thoughtful review is considerable.

Sincerely,

Dr. Ahmed Tewfik
Cockrell Family Regents Chair in Engineering
Chairman, Department of Electrical and Computer Engineering
The University of Texas at Austin
1616 Guadalupe St.
UTA 7.416
Austin, Texas 778701

FIVE SIGNIFICANT PUBLICATIONS

Alex Dimakis
Assistant Professor
University of Texas at Austin

1) D. S. Papailiopoulos, A.G. Dimakis, and V.R. Cadambe, "Repair Optimal Erasure Codes through Hadamard Designs," IEEE Transactions on Information Theory, vol. 59(5), pp. 3021-3037, May 2013.

2) D. Papailiopoulos, A. Dimakis, and S. Korokythakis, "Sparse PCA through Low-rank Approximations," International Conference on Machine Learning (ICML), vol. 28(3), pp. 747-755, 2013.

3) A.G. Dimakis, R. Smarandache, and P.O. Vontobel, "LDPC Codes for Compressed Sensing," IEEE Transactions on Information Theory, vol. 58(5), pp. 3093-3114, May 2012.

4) A.G. Dimakis, P.B. Godfrey, Y. Wu, M.J. Wainwright, and K. Ramchandran, "Network Coding for Distributed Storage Systems," IEEE Transactions on Information Theory, vol. 56(9), pp. 4539-4551, Sept. 2010.

5) M. Sathiamoorthy, M. Asteris, D. Papailiopoulos, A.G. Dimakis, R. Vadali, S. Chen, and D. Borthakur, "XORing Elephants: Novel Erasure Codes for Big Data," Proceedings of the VLDB Endowment, vol. 6(5), pp. 325-336, March 2013.

UNIVERSITY OF CALIFORNIA, BERKELEY

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COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRICAL ENGINEERING
AND COMPUTER SCIENCES

BERKELEY, CALIFORNIA 94720-1770

July 22, 2014

Professor Ahmed H. Tewfik
Cockrell Family Regents Chair in Engineering
Chairman, Department of Electrical and Computer Engineering
The University of Texas at Austin
1616, Guadalupe Street
Austin, TX 78701

Dear Ahmed,

I am writing this letter in response to your request for an evaluation of Prof. Alex Dimakis, who is being considered for promtion to the rank of Associate Professor with tenure in your department.

I know Alex from the time he was a graduate student in the EECS department at U. C. Berkeley. Already at Berkeley he had done a number of interesting works in different areas. For instance, in the area of coding, he wrote a paper with Martin Wainwright and Amin Gohari which provided interesting heuristics for improving the performance of linear programming (LP) based decoders for low density parity check codes [J5]. In collaboration with Richard Karp and another student, Constantinos Daskalakis (a student of Christos Papadimitriou, Constantinos is now on the faculty at M. I. T.) he provided a probabilistic analysis of the performance of LP decoding [J4]. He also made a thought-provoking contribution to the enormous literature on gossip based algorithms (a very popular subject given its relevance to distributed algorithms and the availability of many tools for analysis from the theory of convergence rate of Markov chains), where he studied the role of mobility of the nodes in the performance of the algorithm [J3].

An idea of Alex's extraordinary productivity may be gathered from realizing that these works, which are solid contributions in themselves, are among the first five of his now nearly 30 journal publications. Indeed Alex's career really took off after the widespread interest generated by another peice of work that originated during his graduate studies at Berkeley, and, remarkably, is none of the above. (In collaboration) he invented the field of distributed data

storage [J6]. This begins with the simple observation that in large server farms such as are increasingly prevalent, the rate of failures of disks becomes enough of an issue that system reliability is affected, and necessitates the refreshing of data. One way to do this is to use coding across disks so that when one disk fails, what it held can be reproduced from the other disks. Codes now become properly viewed as being distributed over a network and the kinds of questions that are relevant go beyond error correction capability to questions of how much communication bandwidth is needed for regeneration after a failure. The remarkable discovery in this work is that there is a direct connection between this problem and the theory of network coding. This has set off a veritable hailstorm of research: there are already conferences devoted purely to distributed data storage, and there are many groups around the world working on this topic (at Berkeley. led by Prof. Kannan Ramchandran; at CUHK, lead by Prof. Raymond Yeung; and at IISc, Bangalore, led by Prof. Vijay Kumar, to name only three prominent examples); codes are being invented for this purpose, the theory is being made clearer and more established, and efforts are afoot to get this research to transition into practice (as usual the real questions that need to be addressed in practice are somewhat less easy to formulate than those amenable to clean theoretical solutions, so it may still take some time for this work to reach the stage where it really impacts commercial applications, such as server farms).

Alex has been at the forefront of this worldwide research effort, and roughly about half of his activity, based on his publication record, appears to be devoted to developing this theory and its applications. His contributions to this area subsequent to the work that founded the area span the range from novel contributions to the theory, such as the analysis of locally repairable codes, which introduce restrictions on the number of nodes that need to be looked at in the process of repairing the lost data at a failed node [J29], to works motivated by highly practical considerations and geared to standards for distributed data storage that are currently in place, such as the work in [J19] which is backward compatible with the distributed storage architecture used by Facebook, and where the new ideas were validated with a prototype implementation that was also backward compatible with the existing Facebook implementation.

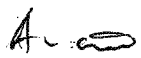
Alex has also continued to make strong contributions to other aspects of

coding theory, signal processing, and distributed systems. The paper [J15], for instance, is particularly notable, since it makes clear formal ties between two major areas: coding theory and compressed sensing, both of which have a huge range of practical applications. The results in this paper provide a framework within which results in one area can be translated into results in the other area and have led, for instance, to to the first explicit constructions of compressed sensing matrices providing the kind of guarantees for sparse recovery from measurements that are the central concern of that field.

In summary I think the case for promotion to tenure is about as clear cut as it could be. Alex is an outstanding, highly productive individual with a wide range of research interests, who is playing a leadership role in some of the most prominent developments in the field.

As a bonus, on a personal level Alex is a charming fellow, great fun to have around. I have heard him give research talks. They are always thought-provoking and very clear, with an emphasis on examples and motivation. As is evident from the teaching evaluations that are in the record, this trait has translated into making him also into a valuable and successful teacher.

Yours sincerely



Venkatachalam Anantharam
Professor, EECS Department
University of California, Berkeley

From: Venkatachalam ANANTHARAM [mailto:ananth@berkeley.edu]
Sent: Wednesday, July 23, 2014 12:05 AM
To: Tewfik, Ahmed H
Subject: Re: Action needed by June 16: would you be able to provide a recommendation letter for Alex Dimakis

Dear Ahmed,

Please find attached my letter of reference on behalf of Dr. Alex Dimakis, as request.

Trust you are having a good summer,

Regards,
Venkat

Venkatachalam Anantharam

University of California -- Berkeley

Bio: Venkat Anantharam is on the faculty of the EECS department at UC Berkeley. He is a recipient of the Philips India Medal and the President of India Gold Med al from IIT Madras, an NSF Presidential Young Investigator award from the U.S. National Science Foundation, and an IBM Faculty Development award. He is a co-recipient of the 1998 Prize Paper award of the IEEE Information Theory Society and a co-recipient of the 2000 Stephen O. Rice Prize Paper award of the IEEE Communications Theory Society. He is a past associate editor for the IEEE Transactions on Information Theory and for the Annals of Applied Probability. He is a Fellow of the IEEE.

A. JAMES CLARK SCHOOL OF ENGINEERING
GLENN R. MARTIN INSTITUTE OF TECHNOLOGY

Prof. Alexander Barg
Department of Electrical and Computer Engineering
Institute for Systems Research
Department of Computer Science
Program in Applied Mathematics, Statistics and Scientific Computation

Prof. Ahmed Tewfik
Cockrell Family Regents Chair in Engineering
Chairman, Department of Electrical and Computer Engineering
The University of Texas at Austin
1616 Guadalupe St.
UTA 7.416
Austin, Texas 778701

August 6, 2014

Dear Prof. Tewfik:

I am writing in response to your letter of June 27, 2014 to provide evaluation of the accomplishments of Dr. A. Dimakis for his promotion to the position of Associate Professor. I am familiar with some of the research of Dr. Dimakis because of our overlapping academic interests. I also know Dr. Dimakis personally from our meetings at academic conferences. A few years ago I invited him to present his work on distributed storage at our research seminarat UMD.

The research of Dr. Dimakis is concentrated in some of the areas of electrical engineering and computer science that are currently undergoing rapid development. I am most familiar with his work on coding for distributed storage, an area to which he has made some of the early foundational contributions. One of the major bottlenecks in the operation of large-scale data centers is related to persistent disk failures which render some of the data permanently or temporarily unavailable. Such problems would be typically addressed relying on classical methods of error correcting codes; howeve,r in the considered applications the sheer volume of data makes the known methods impractical. In this area Dr. Dimakis (with collaborators) has isolated the concepts of repair codes and codes with the locality constraints, which incorporate such restrictions as the amount of data transmitted in the system for the purpose of data recovery as well as the number of drives to be accessed before the data from the lost drive can be restored. The works of Dr. Dimakis in this area have had a significant impact on the development of coding theory: it is fair to say that to some extent they have shaped subsequent research devoted to coding for data centers (the notion of locality was also independently introduced by the Microsoft group). In particular, a few sessions at the latest IEEE International Symposium on Information Theory were entirely devoted to coding for distributed storage. Moreover, one of the plenary talks at the Symposium was entirely focused on this topic. I myself have started to work on the locality problem, having learned about it from the papers of Dr. Dimakis (among others), and my first paper on this topic appears in this month's IEEE Transactions on Information Theory.

In his other interesting work, Dr. Dimakis has connected two seemingly independent procedures of optimization by linear prgramming, namely, decoding binary codes, and recovering a sparse real signal from linear observations. He and his co-authors proved that good binary codes can provide good measurement matrices for the sparse recovery (compressed sensing) problem. While this is not the only way of constructing such matrices from binary codes, the challenge of linking the two apparently

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TEL. +1 301 405 7135, FAX +1 301 314 9281, EMAIL: ABARG@UMD.EDU

different settings was put forward in the celebrated foundational paper by Candés and Tao. This challenge was resolved by Dimakis's work.

The main strength of Dr. Dimakis's research is his ability to formulate new theoretical questions based on real-life engineering problems, and make the first steps in the analysis of these questions. This trait determines both the novelty and impact of his research. Most of his recent work including investigations of distributed cashing, links between index coding and distributed storage problems on graphs, and machine learning is propelled by such applications.

An indication of the practical relevance of his work is given by his ongoing collaborations with major industrial partners who either test or use his code designs for distributed storage applications. Independently, a similar code design has been implemented by Microsoft based on the contributions of its researchers, reportedly saving the company a significant portion of expenses in the operation of data centers. This dimension of Dr. Dimakis's work has also led to a sustained funding record from both industry and the NSF. Earlier than many, he has won a Career award from the NSF. His publication record is nothing short of stellar, and his name and research have become widely known in our community.

In summary, I think that Prof. Dimakis is one of the most active young scholars in our area. He is well positioned to choose between a career path of applied engineering with involvement in product development, and a theoretician with deep results in a focused area. His accomplishments to date more than support his promotion request which I support in highest terms and with no resevations.

Sincerely yours,

Alexander Barg

Brief bio of A. Barg: My research areas are information theory, coding theory, applications of coding in memory and storage systems, and algebraic combinatorics. I have over 25 years of research experience and have published about 70 journal papers. I was the Technical Program Chairman of the 2006 IEEE International Symposium on Information Theory as well as of the 2010 and 2015 IEEE Information Theory Workshops. A fellow of IEEE, I was a member of the Board of Governors of the IEEE Information Theory Society in 2008-2010. I am presently a member of the editorial board of *SIAM Journal on Discrete Mathematics*, *Problems of Information Transmission*, *Advances in Mathematics of Communications*, and *International Jounral of Information and Coding Theory*. Prior to assuming my current post of a professor in the ECE Department of UMD (2003) I spent a number of years as a member of technical staff of Mathematical Sciences Research Center of Bell Laboratories, Murray Hill, NJ. My UMD web page contains a detailed account of my research, publications and other activities.

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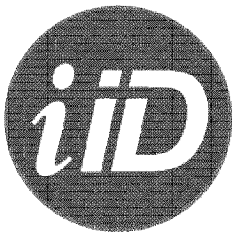
TEL. +1 301 405 7135, FAX +1 301 314 9281, EMAIL: ABARG@UMD.EDU

From: alexanderbarg@gmail.com [mailto:alexanderbarg@gmail.com] **On Behalf Of** Alexander Barg
Sent: Wednesday, August 6, 2014 9:36 AM
To: Tewfik, Ahmed H
Cc: cjjp@mail.utexas.edu; jildagayle@gmail.com
Subject: Letter of reference for Dr. Alex Dimakis

Dear Prof. Tewfik,
Please find attached my evaluation letter of Dr. Alex Dimakis.
Sincerely,

Alexander Barg
Professor, Department of Electrical and Computer Eng.
Institute for Systems Research
University of Maryland
College Park, MD 20817
http://www.ece.umd.edu/~abarg



Robert Calderbank
Professor of Electrical Engineering
Director, Information Initiative at Duke
Duke University
Durham, NC 27708
robert.calderbank@duke.edu
Telephone: 919-613-7874

July 27, 2014

Recommendation: Alex Dimakis

I am very impressed by Alex Dimakis.

Before the papers by Alex and his collaborators it was standard to propose MDS codes to store k symbols across N disks so that a disk array would be able to recover from N-k disk failures. The drawback is that access to at least k disks is required to correct a single disk failure. Alex showed that repair bandwidth can be reduced through array codes where the stored symbols or packets are vectors of length *l*. He is first author on the paper that started the new field of coding for distributed storage:

A.G. Dimakis, P.B. Godfrey, Y. Wu, M.J. Wainwright, and K. Ramchandran, Network Coding for Distributed Storage Systems, *IEEE Transactions on Information Theory*, Vol. 56 (9), pp. 4539-4551, September 2010

The importance of this paper was recognized by the Joint Information Theory and Communication Theory Best Paper Award in 2012 and it has been enormously influential. It has sparked the development of an entirely new research direction in Coding and Information Theory and the speed with which new insights have been translated into commercial systems is quite remarkable. Microsoft is using locally reparable codes in Windows Azure Storage and Alex has worked with Facebook on the design of HDFS RAID. Distributed storage is a big idea that is having a big impact and Alex is driving both theory and practice.

About 18 months ago my Princeton graduate student Sreechakra Goparaju became interested in codes for distributed storage after reading

D.S. Papailiopoulos, A.G. Dimakis, and V.R. Cadambe, Repair Optimal Erasure Codes through Hadamard Designs, IT Vol. 59 (5), May 2013

Array codes use stored symbols or *packets* that are vectors of length *l*. This length is called the sub-packetization factor, and for exact recovery of *systematic disks* in an MDS code of low redundancy ($k/N > \frac{1}{2}$) the best known codes have a sub-packetization factor that is exponential in k. In fact Itzhak Tamo had conjectured that given the sub-packetization factor *l* the maximum number of systematic nodes k is of the order log(*l*) regardless of the number of parity nodes r. We focused on the converse and were able to reduce the upper bound on k from a quantity that was exponential in *l* to a quantity that was logarithmic in *l*. Our paper appeared in the May 2014 issue of the IEEE Transactions on Information Theory.

What I find most fascinating about this second paper by Alex is the connection he makes to interference alignment. Existence of an optimal bandwidth (k+3, k+1, *l*) MDS code operators reduces to existence of k linear operators ϕ_i on an ambient *l*-dimensional space, and k

subspaces S_i each of dimension $l/2$ with the following properties: (1) If I and j are distinct then ϕ_l preserves S_j; and (2) $S_l \phi_l$ and S_l are complementary. Our bounds on sub-packetization factors are obtained by using these conditions to show that sets of operators obtained by taking inner products are linearly independent.

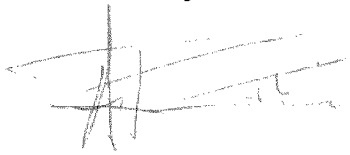
I think that by demonstrating the value of local recovery, Alex has added a new dimension even to the way that we think about classical error correcting codes. Coding theorists were accustomed to focus entirely on minimum distance but we have come to appreciate the value of designing codes with low weight parity checks. My most recent work with my student Sreechakra does this for classical binary cyclic codes. When Sreechakra thinks about postdoc opportunities Alex is at the top of his wish list. Graduate students are somewhat risk averse so this placement says a great deal about his reputation.

If I were to compare Alex to others at the same career stage, then I would say that he compares favorably with the very best researchers at the leading universities. Syed Jafar (UCSD) is acclaimed for his discovery of interference alignment, and while the concept has great potential in wireless communication, the pace of translation to commercial practice does not match that of coding for distributed storage. The same is true of network information theory as pioneered by Young-Han Kim (UCSD) and his advisor Abbas El Gamal (Stanford). Henry Pfister (Texas A&M moving to Duke) and Andrea Montanari (Stanford) have made fundamental contributions to decoding via message passing. These ideas have penetrated many communication standards but neither Andrea nor Henry were heavily involved in translation to practice. If I were to ask a two part question - *What was the idea and what difference did it make?* – then I would find it difficult to rank anyone ahead of Alex.

I have focused my letter on coding for distributed storage but Alex has more dimensions. For example, his work on non-negative sparse PCA and discovery of sparse subgraphs is highly appreciated by the Machine Learning community, as can be seen by the series of papers at ICML, an extraordinarily competitive conference.

I have not the slightest reservation about promotion to Associate Professor with tenure at UT, Austin and would be delighted to answer any questions you might have.

Yours sincerely,



Robert Calderbank

Professor of Electrical Engineering and Computer Science
Director, Information Initiative @ Duke

VP Research, AT&T (Retired)

Brief Biography:

My current position is Director of the Information Initiative at Duke University, where I am Professor of Electrical Engineering, Computer Science and Mathematics. I joined Duke in 2010, completed a 3 year term as Dean of Natural Sciences in August 2013, and also served as Interim Director of the Duke Initiative in Innovation and Entrepreneurship in 2012. Before joining Duke I was Professor of Electrical Engineering and Mathematics at Princeton University where I

also directed the Program in Applied and Computational Mathematics. Before joining Princeton University I was Vice President for Research at AT&T. As Vice President for Research I managed AT&T intellectual property, and I was responsible for licensing revenue. I am an IEEE Fellow and an AT&T Fellow, I was elected to the National Academy of Engineering in 2005, and I received the 2013 IEEE Hamming Medal and the 2015 Shannon Award for contributions to coding theory and communications.

At the start of my career at Bell Labs, I was responsible for research innovations in a progression of voiceband modem standards that moved communications practice close to the Shannon limit. I also launched the Bell Labs research program in signal processing and error correction for advanced read channels (magnetic recording). These two product families played a significant role in transforming AT&T Microelectronics from a vertically integrated cost center to a commercially based supplier of electronic components. Together with Peter Shor and colleagues at AT&T Labs I then developed the group theoretic framework for quantum error correction. This concept has changed the way physicists view quantum entanglement, and is the foundation for fault tolerant quantum computation.

Together with Vahid Tarokh and Nambi Seshadri, I developed the idea of correlating signals across different transmit antennas to improve the reliability of wireless communication. Since publication in 1997, this form of coding has progressed from theory to incorporation in a broad range of wireless standards wireless standards including UMTS, IEEE 802.11n, IEEE 802.16, and IEEE 802.20.

From: Robert Calderbank, Ph.D. [mailto:robert.calderbank@duke.edu]
Sent: Sunday, July 27, 2014 8:17 PM
To: Bearden, Carole A
Cc: Tewfik, Ahmed H; Jilda Bolton (jildagayle@gmail.com)
Subject: RE: Letter of reference for Dr. Alex Dimakis

My letter is attached

UNIVERSITY OF TORONTO
Department of Electrical & Computer Engineering
10 King's College Road
Toronto, Ontario, Canada M5S 3G4

Dr. Ahmed Tewfik
Cockrell Family Regents Chair in Engineering
Chair, Department of Electrical and Computer Engineering
The University of Texas at Austin
1616 Guadalupe St.
UTA 7.416
Austin, Texas 778701
U.S.A.

July 30, 2014

Dear Dr. Tewfik,

Thank you for your letter of June 20, 2014, requesting an assessment of the scholarly work of Professor Alexandros G. Dimakis. I am pleased to comply, as this is case is, to my mind, a very straightforward one.

I have met Prof. Dimakis from time to time at various conferences and workshops. Although we have had occasion to discuss a few research problems, we have never formally collaborated.

I believe that Prof. Dimakis is one of the strongest researchers of his generation in information theory and coding. His career is so far on an outstanding trajectory, with prize paper awards, an NSF Career award, invitations to give keynote lectures, etc.

His work, particularly that related to "regenerating codes" for distributed storage systems, has had high impact, motivating such renowned coding theorists as Vijay Kumar (and others) to begin their own investigations of this topic. In their much celebrated 2010 paper published in the *IEEE Transactions on Information Theory*, Alex and his co-workers have defined an important new problem in coding and information theory: the *code repair problem*, which considers the tradeoff between the amount of information stored in each node and communication capacity needed to to repair a lost symbol (i.e., a disk) in a distributed storage system, while preserving the fault-tolerance of the code. The harder (and practically important) problem of exact repair (in which the codeword itself, not just the code's fault-tolerance, is preserved upon repair) has been an ongoing subject of Alex's work, with many important contributions made. Alex's more recent concept of locally repairable codes is also having significant impact.

I am very impressed that Alex has very actively been working to have locally repairable codes adopted as a part of production cloud-storage systems based on the Hadoop Distributed File System that is used by Facebook and many others.

I am also familiar with Alex's work on linear programming (LP) decoding of binary linear codes. In this elegant line of work, the performance of the LP decoders is improved by guessing the values of some bits. Interestingly, in recent work with co-authors, Alex was able to make a connection

between this line of work and the basis-pursuit LP relaxation used in compressed sensing.

All of this work would certainly be sufficient for promotion to Associate Professor with tenure at any top university. But Alex's work does not stop here. Alex has made fundamental contributions to gossip algorithms, to problems of distributed caching, to machine learning, and to index coding! According to Google Scholar, Alex's papers have been cited over 3600 times, which is indeed an impressive statistic for any researcher just six years beyond the completion of his Ph.D.

Professor Dimakis is publishing his work in all of the right venues. He has published most of his work in the *IEEE Transactions on Information Theory*, the top journal in the field, but I note that he has also published, as is appropriate, in *IEEE Transactions on Signal Processing*, *IEEE Journal of Selected Topics in Signal Processing*, *Proceedings of IEEE*, etc. He is also a frequent contributor to conferences and workshops in information theory, signal processing, computer networks, computer science, etc.

Alex gives fantastic research talks. His presentations are wonderfully well prepared and delivered in a lively, enthusiastic way. I would expect that his courses are highly rated by students; I am sure that he is a popular teacher.

I congratulate you on having been able to attract Alex Dimakis to UT Austin. His presence adds strength to an outstanding group of researchers in communications and information theory. The level (both in quality and quantity) of Professor Dimakis's scholarly work leaves no doubt that his promotion to Associate Professor with tenure is very well warranted.

Sincerely,

Frank Kschischang

Frank R. Kschischang
Professor and Canada Research Chair
Fellow of the Royal Society of Canada

From: Frank Kschischang <frank@ece.utoronto.ca>
Date: July 30, 2014, 6:35:09 PM CDT
To: "Bearden, Carole A" <cjjp@mail.utexas.edu>
Subject: Re: Gentle Reminder - Letter of reference for Dr. Alex Dimakis

Dear Carole,

Not a pest at all --- the letter is attached. My apologies for the delay.

Kind regards,
-- Frank Kschischang

The Edward S. Rogers Sr. Department of Electrical and Computer Engineering
University of Toronto
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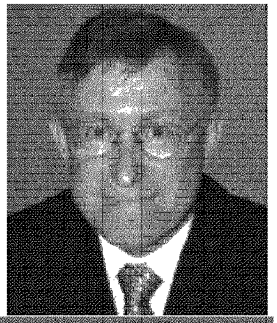

Research Interests

Professor Kschischang's research interests are in the area of digital communications, particularly in the area of communication algorithms as used, for example, to decode information transmitted over a noisy channel with an error-correcting code. Applications for this work occur in modem design for wireless communication, free-space optical communication, fibre-optic communication, powerline communication, digital subscriber lines, etc., as well as in information distribution over the Internet. Keywords: factor graphs, graphical models, the sum-product algorithm, low-density parity-check codes, turbo codes, network coding, trellis-coded modulation, trellis structure of codes, constellation shaping, multidimensional sphere packing.

Awards

Nov. 1992: EE Class of 9т3 Professor of the Year
May 1999: Ontario Premier's Research Excellence Award, *"in recognition of research into new communications algorithms that will improve telecommunications"*
Jan. 2001: Canada Research Chair (Tier I); **renewed** Jan. 2008.
Nov. 2001: CE Professor of the Year
Nov. 2003: ECE Professor of the Year
Jan. 2006: Fellow, IEEE, *"for contributions to trellis structures, graphical models and iterative decoding techniques for error-correcting codes"*
Jan. 2006: Fellow, Engineering Institute of Canada, *"for significant contributions to engineering in Canada"*
May 2006: Faculty Teaching Award, *"in recognition of superb accomplishment in teaching"*
May 2008: ECE Student Club Departmental Teaching Award, *"for excellence in undergraduate teaching"*
May 2009: ECE Student Club Departmental Teaching Award
Mar. 2010: Killam Research Fellowship: *Awarded by the Canada Council for the Arts to recognize distinguished Canadian scholars; provides two years of release time from teaching and administrative duties to pursue independent research.*
May 2010: University of Toronto Faculty Award of Excellence, *"recognizing excellence in teaching, research, and professional endeavours" (awarded annually to one faculty member at the University of Toronto)*
Jun. 2010: IEEE Communications Society and Information Theory Society Joint Paper Award, *"for the paper co-authored with Ralf Kötter entitled 'Coding for Errors and*

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Phone: (080) 2293 3155 email: pvk1729@gmail.com

August 4, 2014

Dr. Ahmed Tewfik
Cockrell Family Regents Chair in Engineering
Chairman, Department of Electrical and Computer Engineering
The University of Texas at Austin
1616 Guadalupe St.
UTA 7.416
Austin, Texas 778701

Dear Professor Tewfik:

It gives me great pleasure to write a letter recommending Dr. Alex Dimakis to the post of Associate Professor. I first got to know of the very interesting line of research opened up by his PhD thesis back in December 2008 when his advisor Professor Kannan Ramchandran had occasion to visit the Indian Institute of Science.

In a distributed storage system, data pertaining to a file is stored in redundant fashion across nodes in the network. A simple and widely used form of redundancy is triple replication in which the same data is stored on three different nodes to protect against independent node failure. While triple replication provides the requisite robustness to node failure, it comes at the cost of an overhead of 200%. An alternative to triple replication is to use erasure codes such as Reed-Solomon (RS) codes which offer the same levels of resiliency, but at lower values of storage overhead. An RS code maps k message symbols onto $n > k$ coded symbols and stores each coded symbol on a different node. A useful feature of RS codes is that the entire data file can be recovered by connecting to any k nodes. RS codes suffer however, from the drawback that when a particular node fails, a replacement node must download the entire file in order to be able to replicate the data stored in the node. This is clearly wasteful of network resources given that a given data node stores but a small fraction of the entire data file.

This led Dr Dimakis to ask if it were possible to design codes which had the desirable "any k out of n" property of a RS code, but which would yet permit a failed node to be regenerated with small download. While in hindsight, this might seem like a logical line of approach, to me and other coding theorists, this was a brilliant line of thought, for, from the outset, it is not clear that such a code is even constructible given the optimality of RS codes. It also implies the ability to build codes from which reliable, *partial data recovery* is possible. Dr Dimakis was able to come up with handcrafted examples of such codes. These examples showed that the key to making this idea work was to use codes over a vector alphabet, i.e., codes in which a code symbol is not the customary scalar drawn from a finite field, but rather a vector of symbols drawn from the field. The passing from a scalar to a vector alphabet is an important step and is variously referred to in the literature as as symbol extension or sub-packetization.

In conjunction with co-researchers Godfrey, Wu, Wainwright and his PhD advisor, Kannan Ramchandran, Dr Dimakis then formalized the requirements of a class of codes they defined as *regenerating codes*. The cut-set bound of network coding was used to determine the maximal size of a file meeting the requirements of a regenerating code. It turns out that amongst the class of optimal codes, there was a tradeoff between the amount of data stored and the amount of data download needed for node repair, termed the repair bandwidth. Codes at the two extremes of this tradeoff were termed Minimum Storage Regenerating (MSR) and Minimum Bandwidth Regenerating (MBR) codes respectively. All of this and more appeared in print in a Sep. 2010 issue of the *IEEE Trans. on Information Theory*.

This paper has attracted the attention of both coding theorists as well as those seeking to apply coding theory to storage applications and has received over 600 citations, thus far. A proof-of-concept prototype of a Distributed File System based on the concepts of a regenerating code was set up by researchers in the *Institute for Network Coding*, Chinese University of Hong Kong. Regenerating codes also feature in a tutorial on erasure coding for storage applications by Prof James Plank who is an expert in this area. Leading coding theorists from across the world have been engaged in the design and study of these codes. The results in the paper also throw up some very interesting questions, for example, can one construct optimal codes with exact repair for all points on the tradeoff ? What is the smallest level of sub-packetization required for a given set of design parameters ? A variety of techniques have been employed to study these codes including interference alignment, combinatorial designs and information-theory inequality provers. Based on my strongly positive impressions of this paper, I successfully nominated it for the *2010 IEEE Data Storage Technical Committee's Best Paper Award* and was happy to note that the paper subsequently also very deservingly received the *Joint IEEE Information Theory and Communications Society Best Paper Award* of 2012.

There are many other contributions by Dr. Dimakis to the theory of regenerating codes as well. For example, in a subsequent paper, Dr Dimakis and his group addressed the challenge of constructing high-rate regenerating codes operating at the MSR point and came up with a very interesting construction based on the structure of a Hadamard matrix for codes with two parities and consequently high rate $\frac{k}{k+2}$.

Around the same time as regenerating codes were being developed, a group of researchers at Microsoft (Gopalan et. al.) introduced the notion of *codes with locality*. A code with locality is a code in which the information symbols within the code are protected by codewords of smaller length, corresponding to a subset of code symbols. A principal advantage of a code with locality is that is reduces sharply the number of helper nodes contacted by a replacement node, to a fraction of that needed in the case of an RS code. One such code constructed by the Microsoft team, was employed in the Windows Azure Storage System. The code was in effect, a replacement for an RS code that for the same reliability and number of nodes contacted for node repair reduced the overhead from 50% to 33%. Given the peta bytes (10^{15} bytes) of information stored in a data center with the attendant electricity, cooling and other costs, this was estimated to have saved Microsoft millions of dollars. This description is provided in part, to given an idea of the kind of impact this line of research can have.

At the *Workshop on Big Dynamic Distributed Data* (conducted in conjunction with *VLDB 2013*) Dr. Dimakis presented a paper presenting evaluation results pertaining to a code with locality constructed by his group. These codes were termed as locally repairable codes. In this work, Dr Dimakis' team designed and implemented HDFS-Xorbas, a module that replaces the Reed-Solomon codes present in the RS-coded Hadoop Distributed File System known as HDFSRAID with a locally repairable code called HDFS-Xorbas constructed by his team. HDFS-Xorbas was evaluated using experiments on *Amazon Elastic Compute Cloud (EC2)* as well as on a Facebook cluster (one of the team members, Dhruba Borthakur, was a researcher from Facebook). It was shown that employing HDFS-Xorbas caused a 50% reduction in input I/O and repair traffic over HDFS RAID in exchange for a 14% increase in storage overhead. What I feel is remarkable about the paper is the effort Dr Dimakis and his team put in to enable them to carry out these experiments. This shows an uncommon commitment to theoretical research that is driven by practical, engineering concerns. The paper was accorded the status of a keynote talk at the workshop.

This is just a sampling of some of the research output of Dr. Dimakis. There is other, equally interesting work which I am not quite as familiar with, such as his work on index coding, coded caching as a means to alleviate bandwidth concerns in wireless communication, the interesting connection made between compressive sensing and error correction and his work on machine learning. It is quite impressive that at this early age, Dr. Dimakis has conducted collaborative research with such a wide array of researchers. I recall a UCSD *Information Theory and its Applications Workshop* at which a graph showing collaboration amongst researchers had been drawn up and the node corresponding to Dr. Dimakis came up as being very strongly connected, this despite the fact that he was only a few years past his PhD degree. Dr. Dimakis is very well read and has a singular ability to connect with people across disciplines. For example, at the NSF-sponsored mini-workshop on future directions for distributed storage systems held at UC Berkeley in June 2012and of which he was a co-organizer, the attendees included Arif Merchant from Google and Jin Li form Microsoft.

In summary, my impression of Dr Dimakis is that of an innovative, energetic and motivating researcher who even at this young age, has shown strong leadership capabilities and much more can be expected of him in the future. He is quite clearly, a "superstar" even at this early age and has my most enthusiastic and strongest support for promotion to the level of Associate Professor with tenure at the University of Texas at Austin.

With best regards,

P. Vijay Kumar
Professor & Chairman, Electrical
Communication Engineering,
Indian Institute of Science,
Bangalore, India

and

Adjunct Research Professor,
Electrical Engineering,
University of Southern California,
Los Angeles, CA 90089-2565.

-----Original Message-----
From: Vijay [mailto:pvk1729@gmail.com]
Sent: Monday, August 4, 2014 2:11 AM
To: Bearden, Carole A
Cc: Tewfik, Ahmed H; Jilda Bolton (jildagayle@gmail.com)
Subject: Re: Letter of reference for Dr. Alex Dimakis

Dear Prof Tewfik:

Please find attached my letter of recommendation for Dr. Dimakis and a brief 2page bio. Please free to contact me in case of any questions.

With regards,

Vijay Kumar

1 BIOGRAPHICAL SKETCH – P. Vijay Kumar

1.1 Professional Preparation

B. Tech	Electrical Engg	Indian Instt. Kharagpur	1972-77
M. Tech	Electrical Engg	Indian Instt. Kanpur	1977-79
Ph.D.	Electrical Engg.	Univ. South Calif.	1979-83

1.2 Appointments

Adjunct Professor	EE	USC	2009-present
Professor	ECE	IISc, Bangalore	June 2003- present
Professor	EE	USC	1994-2009
Associate Professor	EE	USC	1989-1994
Assistant Professor	EE	USC	1983-89

1.3 Awards and other Information

1. IEEE Communications Society's Technical Committee on Data Storage Best Paper Award, 2011-12.
2. Invited to deliver a plenary talk at the IEEE ISIT, Hawaii, June 29-July 4, 2014.
3. IEEE Fellow, 2002.
4. 1995 IEEE Information Theory Society's Prize Paper Award.
5. Fellow of the Indian National Academy of Engineering, 2014.
6. Best Paper Award (Algorithmic Track) at DCOSS 2008.
7. The 1994 *USC School-of-Engineering Senior Research Award.*
8. A CDMA sequence family, introduced in a 1996 co-authored paper appears as the short uplink spreading code in the 3rd generation global mobile communication IMT-2000, W-CDMA Standard.
9. Research interests include codes for distributed storage, distributed function computation, coding theory, cooperative wireless communications and wireless sensor networks.

1.4 Ten Significant Publications

1. K. V. Rashmi and N. B. Shah and P. V. Kumar, "Optimal Exact-Regenerating Codes for Distributed Storage at the MSR and MBR Points via a Product-Matrix Construction," *IEEE Trans. on Inform. Theory*, vol. 57, no. 8, pp. 5227–5239, Aug. 2011 [Best Paper Award, IEEE Communication Society's Technical Committee on Data Storage].
2. N. B. Shah, K.V. Rashmi, P. V. Kumar and K. Ramchandran, "Distributed Storage Codes with Repair-by-Transfer and Non-achievability of Interior Points on the Storage-Bandwidth Tradeoff," *IEEE Trans. on Inform. Theory*, vol. 58, no. 3, pp. 1837 – 1852, March 2011.
3. N. B. Shah, K.V. Rashmi, P. V. Kumar and K. Ramchandran, "Interference Alignment in Regenerating Codes for Distributed Storage: Necessity and Code Constructions," *IEEE Trans. on Inform. Theory*, vol. 58, no. 4, pp. 2134–2158, April 2012.
4. Govinda M. Kamath, N. Prakash, V. Lalitha, P. V. Kumar, "Codes with Local Regeneration," *IEEE Intnl. Symp. Inform. Theory*, July 7-12, 2013.
5. B. Sasidharan and P.V. Kumar, "High-Rate Regenerating Codes through Layering," *IEEE Intnl. Symp. Inform. Theory*, July 7 – July 12, 2013.
6. Petros Elia, B. A. Sethuraman, P. Vijay Kumar, "Perfect Space-Time Codes for Any Number of Antennas, " *IEEE Trans. Inform. Theory*, Nov 2007, vol.52, No.11, pp. 3853 - 3868.

7. Petros Elia, K. Raj Kumar, Sameer A. Pawar, P. Vijay Kumar Hsiao-feng Lu,"Explicit Space-Time Codes Achieving the Diversity-Multiplexing Gain Tradeoff," *IEEE Trans. Inform Theory*, Sep. 2006, vol. 52, No. 9, pp. 3869-3884.

8. K. Shum, I. Aleshnikov, P. V. Kumar, and H. Stichtenoth, A Low-Complexity Algorithm for the Construction of Algebraic Geometric Codes Better than the Gilbert-Varshamov Bound, *IEEE Trans. Inform. Theory*, pp. 2225-2242, Sep. 2001.

9. A. R. Hammons Jr., P. V. Kumar, A. R. Calderbank, N. J. A. Sloane and P. Sol'e, The Z_4-Linearity of Kerdock, Preparata, Goethals and Related Codes, *IEEE Trans. Inform. Theory*, pp. 301-319, March 1994 [IT Prize Paper Award].

10. P. V. Kumar, T. Helleseth and A. R. Calderbank, " An Upper Bound for Weil Exponential Sums over Galois Rings and Applications," *IEEE Trans. Inform. Theory*, vol. IT-41, pp. 456-468, March 1995.

1.5 Synergistic Activities

- Elected to the Board of Governors of the IEEE Information Theory Society (2013-2015)
- TPC Co-Chair, *IEEE Intnl. Symp. Inform. Theory (ISIT)*, Hong-Kong June 14-19, 2015.
- Invited speaker at the NSF Workshop, *Bridging the Gap between Wireless Networking Technologies and Advances at the Physical Layer*, August 26-27, 2007, Washington DC.
- Technical Program Co-Chair of the *IEEE Information Theory Workshop* on Information Theory for Wireless Networks, July 1 - 6, 2007 Bergen, Norway.
- Co-organizer of the Spring 1999 & Dec. 2003 Oberwolfach Conferences on Coding Theory.

Collaborators Ozan Koyluoglu (University of Arizona), Anurag Kumar (IISc), Sandeep Pradhan (U Michigan), K. Ramachandran (UCB), Natalia Silberstein (Technion), Sriram Vishwanath (UT Austin).

Advisors of PI R. A. Scholtz (USC), Lloyd Welch, (USC) and P. R. K. Rao (IIIT Hyderabad)

Past and Present Ph.D. and Master's Students **PhD** Balaji Ganesh (IISc), S. Birenjith (IISc), Tarun Choubisa (IISc), L. Vadlamani (IISc), U. Raviteja (IISc), N Prakash (IISc), K. Vinodh (IISc). (7 PhD students).

Masters Christo Thomas (Broadcomm, Bangalore), K. Govinda (Stanford), Vanamali Bhat (Cisco), Sharanappa Ijeri (Brocade Comm.), K. V. Rashmi (UC Berkeley), Nihar Shah (UC Berkeley), Abu Sajana (Chalmers, Sweden), S. Ramanathan (George Mason University), V. Aswath, Ajit Prabhu (IISc), N. Siddhant (IISc), Nikhil Krishnan (IISc), Kaushik Senthoor (IISc), K. Sreeram (UCB), L. Vadlamani (IISc), A. Ray (UT Austin), N. E. Venkatesan (Flarion), T. Agarwal (TAMU), K. Vinodh (IISc), M. Anand (Qualcomm), R Abu Sajana (Chalmers, Sweden), S. Ramanathan (IISc), S. Birenjith (COE, Thiruvanathapuram), P. Bhambhani (Cisco). (24 Master's students).

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ALON ORLITSKY
Qualcomm Professor of Information Theory and its Applications

August 17, 2014

Prof. Ahmed Tewfik
Department of ECE
University of Texas at Austin

Dear Prof. Tewfik,

I write to lend my strongest endorsement for the promotion of Prof. Alex Dimakis to the rank of associate professor with tenure at the University of Texas at Austin. I have followed Alex's research and career for the past five or so years. Alex is one of the most creative, forward-looking, and influential information theory researchers of his generation. He has made significant contributions to several research problems and created a new area of active research interest – the distributed-storage repair problem. His many achievements merit tenure at the best universities in the world.

Alex has worked on several research areas, including compressed sensing, gossip algorithms, caching, channel coding, index coding, and some basic problems in convexity and probability. These contributions alone would have merited his promotion.

However, in addition, his main contribution has been the introduction of the *repair problem* in distributed storage systems, where a lost or corrupted symbol is recovered by accessing few other symbols. This problem is of great importance in "cloud-based" systems, and has therefore generated significant followup and publicity.

The simplest way to correct corrupted symbols is by replicating each symbol in multiple locations. This method requires the fewest transmissions as each symbol can be reconstructed by copying one of its replicas. However it also requires duplicating the whole data at least twice. For this reason, several systems use erasure coding techniques (typically, Reed-Solomon codes).

The naive way to repair erasure codes is to reconstruct all the data. For example in an (n, k) Reed-Solomon code (or any MDS code), any k symbols suffice to reconstruct the original k. Therefore one way to repair a single lost symbol is to contact any k surviving symbols and decode all k information symbols. The problem however is that it involves contacting a large number of nodes and communicating a k-factor more information than was lost.

Alex started investigating how much better one can do compared to this naive repair process. He first considered the *functional repair* problem that allows the reconstructed symbol to differ from the original as long as the distance (i.e. fault tolerance) of the code remains invariant. In "Network Coding for Distributed Storage Systems" he and co-authors completely characterized the amount of communication needed for functional repair and established a tradeoff between the amount of information stored per node and the repair communication required. Their proofs used a reduction to a multicasting network coding problem and computed a set of cuts on an infinite graph, hence the achievable region is called the *cut-set* region.

The natural problem that remained after this paper was whether this cut-set region is achievable for the strictly harder problem of exact repair where the lost symbol needs to be reconstructed exactly. This problem was subsequently investigated in a large number of papers by Alex and others.

The precise solutions are currently the topic of active investigation by many researchers. Alex himself has made several important contributions. Some of them used a connection to interference alignment that was pursued in "Reducing Repair Traffic for Erasure Coding-Based Storage via Interference Alignment" and "Repair Optimal Erasure Codes through Hadamard Designs". He also has made a significant effort in the practical implementation of real storage systems that I believe may influence the design of future Facebook storage systems.

As mentioned above, Alex's work was followed up by a number of researchers in both academia and industry. As an indication of the problem's traction, it was the topic of a plenary talk by Prof. Vijay Kumar at the recent International Symposium on Information Theory (ISIT). These achievements are rare among established researchers, let alone for junior faculty like Alex. They leave no doubt in my mind that he fully deserves promotion and tenure at UT Austin.

Sincerely,

Alon Orlitsky

From: Alon Orlitsky [mailto:aorlitsky@eng.ucsd.edu]
Sent: Sunday, August 17, 2014 5:18 PM
To: Bearden, Carole A
Cc: Tewfik, Ahmed H; Jilda Bolton (jildagayle@gmail.com)
Subject: Re: Reference letter for Dr. Alex Dimakis
Importance: High

Dear Carole, Jilda, and Prof. Tewfik,

Attached is my enthusiastic recommendation for Alex's promotion.

I apologize for my delay and would be happy to answer any further questions you may have.

Sincerely,

Alon

Alon Orlitsky

I am a faculty member at UCSD's ECE and CSE departments and am affiliated with Calit2 and the Information Theory and Applications and Wireless Communications Centers. My research concerns information theory, compression, communication, probability estimation, prediction, machine learning, and speech recognition.

1982 ITT International Fellowship

1992 IEEE W.R.G. Baker Award

2005 Fellow, IEEE (for contributions to zero-error information theory)

2006 IEEE Information Theory Paper Award (with Santhanam and Zhang)

2007 Qualcomm Chair for Information Theory and its Applications

2009 Distinguished Lecturer, Information Theory Society

(Student awards for coauthored papers)

2003 Capocelli Prize to Prasad Santhanam for Performance of universal codes over infinite alphabets

2010 ISIT Student Paper Award to Jayadev Acharya for On Reconstructing a Sequence from its Subsequence Compositions

Alcatel·Lucent

Emina Soljanin
Distinguished Member of Technical Staff
Mathematical Sciences Research, Bell Labs

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July 20, 2014

Dr. Ahmed Tewfik
Cockrell Family Regents Chair in Engineering
Chairman, Dep. of Electrical and Computer Eng.
The University of Texas at Austin
1616 Guadalupe St.
UTA 7.416
Austin, Texas 778701

Dear Professor Tewfik:

I am very pleased to support the advancement in rank of Dr. Alex Dimakis to the position of Associate Professor at the University of Texas at Austin. I had a pleasure to review his promotion material, and found his scholarly record very impressive and worthy of a senior position at any of the leading academic institutions in the world.

I first met Dr. Dimakis while he was still a graduate student. He participated in the DIMACS Working Group on Network Coding that I co-organized in January 2005. DIMACS working groups are very small invitation-only workshops, designed to facilitate interactions between participants. Consequently, I got to know and interact with Alex, who immediately impressed us all with both his knowledge and his enthusiasm.

Today, hardly ten years later, Dr. Dimakis is one of the leading researchers in the area of coding for distributed storage, who has already served on various conference program committees, has given numerous invited talks, has thought and written tutorials, and even given keynote talks. It has been a great pleasure for me to follow his progress as a researcher, and to interact with him personally.

Dr. Dimakis and I have similar research interests, and a long track record of working on related topics, distributed storage in particular, although we have never directly collaborated. I have worked in the area of data storage for more than twenty years, starting with the physical layer coding for the magnetic recording read channel. Today my interests in networked distributed storage complement that of Dr. Dimakis. While he is concerned with code design, I am interested in the impact of such codes on various users' quality of experience metrics under different network traffic scenarios, which naturally requires me to stay familiar with and possibly influence the code design.

The early work of Dr. Dimakis and his colleagues on network coding for distributed storage practically started a new research area, which has been recognized by multiple best paper awards. Prior to this work, the literature in this area has acknowledged that, when compared with replication, coding can offer huge storage savings for the same reliability levels, but it has also argued that the benefits of coding are limited, and can easily be outweighed by certain disadvantages and the extra complexity.

The work of Dr. Dimaks established existence (and possible advantages over replication) of new regenerating codes. It has made the communications, signal processing, and information theory research communities aware that of-the-shelf erasure codes used for transmission are not good enough for distributed storage. In multi-disk systems, if a disk fails, data must be recoverable from the remaining storage, to provide reliability, as in transmission. But in addition, failed disks have to be replaced, and either the exact lost data (exact reconstruction) or an equivalent reliability (functional reconstruction) restored, with minimal download from the remaining storage. This work and its follow up have already made impact on industrial distributed storage solutions such as the Microsofts Azure Storage System and the Facebooks Hadoop Distributed File System.

The interests of Dr. Dimakis today span a wide range of problems concerning coding for networking and distributed storage. Together with his collaborators, he has tackled, and in several instances successfully addressed, some notoriously difficult, open problems in combinatorics and probability that arise in allocation and coding for distributed storage.

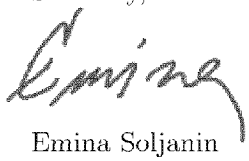
It is hard for me to think of any other researcher in my scientific community who, at such an early stage of his career, so much influenced work of others. In the area of distributed storage, Dr. Dimakis is not only a pioneer, but has been a trail blazer. By interacting with systems experts, he has identified numerous problems and offered first solutions, which were then followed up by coding theorists wishing to join this research direction.

I see an exceptionally promising scientific future for Dr. Dimakis, not only because of his great technical strengths, but also, and even more importantly, because of his unsurpassed enthusiasm and curiosity. He is already (and will continue to be) a leader, as he is always willing to talk about any research problem, eager to collaborate, and above all, seems truly tireless.

Compared to his peers, Dr. Dimakis has an extremely strong academic record, in terms of the quality, significance, and quantity of published research, as well as funding, professional activities including teaching, curriculum development, supervision of research students, and other scholarly activities. This has become especially apparent to me as I handled several other requests for tenure evaluation in the past two years from the leading world universities.

I believe that Dr. Dimakis, as his record shows, has made a terrific start, and deserves to be promoted to the Associate Professor level. Please feel free to call me for further information.

Sincerely,



Emina Soljanin

From: Emina Soljanin [mailto:emina.soljanin@gmail.com]
Sent: Sunday, July 20, 2014 11:11 PM
To: Bearden, Carole A
Cc: emina@research.bell-labs.com; Tewfik, Ahmed H; Jilda Bolton (jildagayle@gmail.com)
Subject: Re: Letter of reference for Dr. Alex Dimakis

Dear Ms. Bearden

My letter for Prof. Dimakis is attached, together with my bio.

Best regards,
Emina

Emina Soljanin
http://ect.bell-labs.com/who/emina

Emina Soljanin received the PhD and MS degrees from Texas A&M University, College Station, in 1989 and 1994, and the European Diploma degree from University of Sarajevo, Bosnia, in 1986, all in Electrical Engineering. From 1986 to 1988, she worked in the Energoinvest Company, Bosnia, developing optimization algorithms and software for power systems control. After graduating from Texas A&M in 1994, she joined Bell Laboratories, Murray Hill, NJ, where she is now a Distinguished Member of Technical Staff in the Mathematics of Networks research department.

Dr. Soljanin's research interests are in the broad area of information and coding theory, and their applications. In the course of almost two decades with Bell Labs, she has participated in a very wide range of research and business projects. These projects include designing the first distance enhancing codes to be implemented in commercial magnetic storage devices, first forward error correction for Bell Labs optical transmission devices, color space quantization and color image processing, quantum computation, link error prediction methods for the third generation wireless network standards, and several aspects of secure communications. Her most recent activities are in the area of network and rateless coding for packet level transmission and distributed storage. For research in these areas, she has won NSF, DARPA, NAE, and ONR funding, for salary, students, travel, and workshops.

Dr. Soljanin is a co-author of more than hundred research papers, co-inventor of more than dozen patents, and has co-authored two-monographs on network coding. Teaching and mentoring have been an important part of Dr. Soljanin's activities. In addition to regular university classes, she has thought a number of short courses such as pre-conference tutorials, special university modules, summer schools, and internal courses at Bell Labs, where she has been mentoring postdocs, Ph.D. students, and summer interns. She is a co-author of a two-part monograph on network coding, which has been widely used for classroom teaching and independent studies. She served as the IEEE IT Society Padovani Lecturer at 2013 North American School of Information Theory.

Dr. Soljanin served as a Technical Proof-Reader, 1990-1992, and as the Associate Editor for Coding Techniques, 1997-2000, for the IEEE Transactions on Information Theory, and has organized and served as a co-chair for the DIMACS Special Focus on Computational Information Theory and Coding 2001–2005 and DIMACS Special Focus on Cybersecurity 2011–2015. Dr. Soljanin spent 2008 as a visiting researcher at Ecole Polytechnique Federale de Lausanne (EPFL), in Switzerland. She is a member of the editorial board of the Springer Journal on Applicable Algebra in Engineering, Communication and Computing AAECP), and a member of the Board of Governors of the IEEE Information Theory Society. Dr. Soljanin has been elevated to IEEE Fellow grade for contributions to coding theory and coding schemes for transmission and storage systems

Stanford | ENGINEERING
Electrical Engineering

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August 8, 2014

Dr. Ahmed Tewfik
Cockrell Family Regents Chair in Engineering
Chairman, Department of Electrical and Computer Engineering
The University of Texas at Austin
1616 Guadalupe St.
UTA 7.416
Austin, Texas 78701

Dear Professor Twefik,

This is a letter of evaluation for Professor Alex Dimakis' promotion case to associate professor with tenure. I have known the candidate since he was a graduate student at Berkeley, and has followed his research. Professor Dimakis' research is in the areas of information theory, coding, machine learning and his research spans from theory to system implementation.

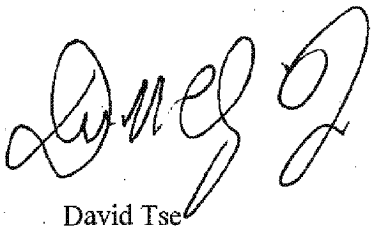
Proferssor Dimakis' most well known and highest impact research to date is his work on coding for distributed storage, which he started in his Ph.D. work and has continued to this day. Traditional formulation of coding problems typically asks the question of how to minimize the amount of redundancy needed to achieve a certain level of reliability. In the case of distributed storage problems where data is distributed across multiple servers and individual servers may fail, this translates to the problem of minimizing the amount of redundancy so that data can be recovered whenever no more than a certain number of servers fail. This problem is well understand and classical codes such as Reed-Solomon codes are long known to be optimal for this problem. However, the traditional formulation of the problem missed one aspect which is becoming increasingly important in modern day large scale data centers: the amount of communication from the existing servers needed to repair the redundancy lost due to a server going down. Professor Dimakis formulated a fundamental tradeoff between the redundancy needed and the repair tradeoff to achieve a certain level of reliability. This is an extremely creative formulation which has very deep connections to other areas of information theory and coding. In particular, Dimakis showed that the problem can be mapped into a network coding problem, and obtained many interesting code designs, both during his Ph.D. thesis and afterwards.

This work has had very significant impact , both in academia and in industry. Multiple sessions in the International Symposium on Information Theory, the flagship conference of the field, are devoted to this problem. (In fact, this problem is the subject of the plenary talk by Vijay Kumar, one of the leading coding theorists, in the ISIT just past.) The original paper has won the IEEE Joint Communication and Information Theory Societies' Best Paper Award. Companies like Facebook, Microsoft and Google have built prototypes to demonstrate the utility of the ideas, some of which have been incorporated into production systems. In fact, Dimakis has collaborated with researchers in Facebook in a significant effort in this direction. With the benefit of hindsight. I would say this direction that was started by Dimakis is the most significant and promising one in network coding since it was invented 15 years ago, and in fact this direction is one of the most exciting in information theory overall in the past few years.

In addition to this line of work, Dimakis has also done work in many other areas. One recent piece of work that impressed me a lot is his work with his student Dimitris Papailiopoulos on sparse principal component analysis (PCA). The sparse PCA problem is a well-known NP-hard problem but Papailiopoulos and Dimakis came up with an algorithm for which they were able to give performance guarantees in terms of the spectrum of the data matrix. This allows them to bypass the pessimistic worst-case performance predicted by NP-hardness and instead show that their algorithm is polynomially time on a lot of real problems of interest.

Given the originality, depth and breadth of Professor Dimakis' contributions, spanning from theory to practice, I have no doubt that he deserves tenure. The field of information theory needs young people like him who are fearless in exploring new research directions. I am looking forward to more exciting research from him in the future.

Sincerely,



David Tse
Professor, Electrical Engineering Department

Sent: Friday, August 8, 2014 4:51 PM
To: cjjp@mail.utexas.edu
Cc: tewfik@austin.utexas.edu; jildagayle@gmail.com; David Tse
Subject: Re: Fwd: Reference Letter for Dr. Dimakis

Dear Carole,

Attached is the reference letter for Dr. Alex Dimakis from Prof. David Tse at Stanford University.

Best regards,

--Helen

****

Stanford Profiles

David Tse

Professor

PACKARD 264 (9510)
WEBSITE

CONTROL & OPTIMIZATION
COMMUNICATIONS SYSTEMS
INFORMATION THEORY & APPLICATIONS

Academic Appointments

- Professor, Electrical Engineering

Bio

Associate Editor, IEEE Transactions on Information Theory, 2001 to 2003

Gilbreath Lectureship from the National Academy of Engineering, 2012

Co-author (with Pramod Viswanath) of the text "Fundamentals of Wireless Communication," which was used in over 60 institutions around the world.

COMMUNICATION THEORY LABORATORY
SCHOOL OF COMPUTER & COMMUNICATION SCIENCES

LABORATOIRE DE THEORIE DE COMMUNICATION
FACULTE INFORMATIQUE ET COMMUNICATIONS

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Lausanne, July 22nd, 2014

To Whom It May Concern:

It is a pleasure to write this letter of reference for Prof. Alex Dimakis. It is also very easy to do. There is no doubt that Dr. Dimakis is one of the most influential, innovative, and original researchers of his generation in the Information Theory community.

I have known Dr. Dimakis probably since around 2006, when he did his profound work on the analysis of LP decoding for sparse graph codes, followed slightly later by his highly cited work on gossip algorithms for sensor networks. He also spent a summer here at EPFL, working with Prof. Martin Vetterli, which gave me addition the opportunity to interact with him and to get to know him. These initial works alone would easily guarantee him tenure. But the nice thing about Dr. Dimakis is that he has not stopped there but in fact is getting stronger and stronger as time passes.

Probably to date his most influential and innovative work concerns his research on distributed storage systems as they are now common place and crucial components for companies such as Facebook, Google, or Amazon. Together with some of his colleagues (mostly Prof. Ramchandran and Prof. V. J. Kumar) he has created a whole new branch of coding theory that takes into account the unique requirements of this field. This has led to the definition of a research area that is at the same time very beautiful and eminently useful. This does not happen every day! Dr. Dimakis has managed to show that ideas from areas like network coding and interference alignment yield fundamental insights into the field of distributed storage, demonstrating both his broad vision and his ability to connect such a priori diverse fields. For the last couple of years the area of distributed storage has resulted in some of the most exciting sessions at our yearly International Symposium of Information Theory. Perhaps even more importantly, it seems that industry is adopting some of the ideas that were generating in the research area, which is probably the ultimate confirmation of the importance of both the field as well as the research.

In addition, Dr. Dimakis was a recipient of the IEEE Information Theory Society and Communication Society Joint paper award for his work in this area in 2012. A very well-deserved honor.

I cannot think of any other person at this stage of his career who has influenced our community so profoundly and Dr. Dimakis is showing no signs of slowing down. I am thinking of myself as a fairly high-energy person but Dr. Dimakis must have an entirely different breakfast since next to him I feel rather old. I am very happy that he is part of our community and I am looking forward to his future contributions.

Dr. Dimakis is in addition a very gifted speaker and he has done more than his share of service to our community.

In summary: I think most highly of Dr. Dimakis. He is as good as they get – smart, innovative, driven, energetic, with good taste in problems and an eye for what is important. And let me not forget one last thing – he makes research fun and exciting!

EPFL Information Processing Group

Should you have any further questions, please do not hesitate to contact me.

Best regard

Rüdiger Urbanke

From: Ruediger Urbanke [mailto:ruediger.urbanke@epfl.ch]
Sent: Tuesday, July 22, 2014 3:15 AM
To: Bearden, Carole A
Cc: rudiger.urbanke@epfl.ch; Tewfik, Ahmed H; Jilda Bolton (jildagayle@gmail.com)
Subject: Re: Letter of reference for Dr. Alex Dimakis
Importance: High

Attached please find my letter of reference for Dr. Alex Dimakis.

Rüdiger Urbanke
EPFL, Switzerland

FIELDS OF EXPERTISE

- coding, communications, information theory, graphical models, methods of statistical physics applied to problems in communications and computer science

Biography

Rüdiger Urbanke held a position at the Mathematics of Communications Department at Bell Labs from 1995 till 1999 before becoming a faculty member at the School of Computer & Communication Sciences (I&C) of EPFL. He is a member of the Information Processing Group.

He is principally interested in the analysis and design of iterative coding schemes, which allow reliable transmission close to theoretical limits at low complexities. Such schemes are part of most modern communications standards, including wireless transmission, optical communication and hard disk storage. More broadly, his research focuses on the analysis of graphical models and the application of methods from statistical physics to problems in communications.

From 2000-2004 he was an Associate Editor of the IEEE Transactions on Information Theory and he is currently on the board of the series "Foundations and Trends in Communications and Information Theory." Since 2013 he has been a Member of the Board of the Information Theory Society as well as a Distinguished Speaker. From 2009 till 2012 he was the head of the I&C doctoral school and in 2013 he served as Dean a. i. of I&C.

Dr. Urbanke is a recipient of a Fulbright Scholarship. He is a co-author of the book "Modern Coding Theory" published by Cambridge University Press a co-recipient of the 2002 and the 2013 IEEE Information Theory Society Paper Award, the 2011 IEEE Koji Kobayashi Award, as well as the 2014 IEEE Hamming Medal.

CURRENT WORK

Many interesting problems in communications and computer science can be phrased as inference problems on sparse graphical models.

I am studying the behavior of such systems as a function of underlying parameters (phase transitions) as well as trying to find efficient algorithms to solve fundamental tasks related to such systems. Message-passing algorithms as well as methods from statistical physics play an important role in my research.

Rüdiger Urbanke's research is sponsored by the Swiss National Science Foundation, the NCCR/MICS (National Center of Competence in Research / Mobile Information & Communication Systems) as well as the CTI.

THE CHINESE UNIVERSITY OF HONG KONG
Shatin, N.T., Hong Kong
Institute of Network Coding
網 絡 編 碼 研 究 所

RAYMOND WAI HO YEUNG
Ph.D., IEEE Fellow
CHAIR PROFESSOR
DEPARTMENT OF INFORMATION ENGINEERING

INC

July 23, 2014

Ms. Carole Bearden
Executive Assistant
The University of Texas at Austin
Electrical and Computer Engineering
ENS Room 236
2501 Speedway, C0803
Austin, Texas 78712-0240
USA

Dear Ms. Bearden,

RE: Professor Alex Dimakils

It is my greatest pleasure to write this letter in support of Prof. Alex Dimakis' promotion to the rank of Associate Professor with tenure.

Prof. Dimakis received his PhD in Electrical Engineering at University of California, Berkeley in 2008. In his PhD thesis, he proposed the use of network coding in distributed data storage systems. A main issue in such storage systems is the following. Since the number of hard disks in the system is large (sometime in the thousands), disk failure is routine and repair of failed disks is necessary from time to time. In an existing system, uncoded data are first downloaded from other disks, and the lost data are reconstructed from the downloaded data. In Prof. Dimakis' PhD thesis, he showed that instead of downloading uncoded data from other disks, if coded data are downloaded, the bandwidth required during the repair process can be significantly reduced. The repair process can then be shortened, which in turn implies higher reliability of the whole system.

Prof. Dimakis' novel approach to distrbuted data storage has started a new research area which has picked up a lot of momentum within a short time. "Repair bandwidth" and "functional repair", which first appeared in his thesis, are now standard terminologies in the research community for distributed data storage. The journal version of this work, published in the September issue of the *IEEE Transactions on Information Theory* in 2010, has accumulated over 600 citations on Google Scholar. It has received the prestigious 2012 Joint IEEE Information Theory and Communications Society Best Paper Award among other awards. Prof. Dimakis has also delivered plenary talks at a few related conferences.

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Prof. Dimakis' invention has the potential to become the core technology for next generation cloud storage. Nowadays, many major services on the Internet are supported by cloud computing and storage. In the future, this will be the single dominant model for Internet service support. As such, the potential social and economic impact of Prof. Dimakis' invention cannot be underestimated.

Prof. Dimakis' publication record is outstanding. Within a few years, he has more than 20 papers published in or accepted by top IEEE Transactions. I am not very familiar with the funding situation in the US, but by looking at the figures, it appears to me that his track record for research grant application is very healthy.

On the personal side, Prof. Dimakis is one of the most dynamic and all-rounded researchers I have ever seen. Though at a very young age, he has already established himself as a leader in the research community. I have no doubt that he will continue to be very successful on anything he wants to pursue.

Yours sincerely,

Raymond W. Yeung

From: Raymond Yeung [mailto:whyeung@ie.cuhk.edu.hk]
Sent: Wednesday, July 16, 2014 10:54 PM
To: Bearden, Carole A
Cc: Tewfik, Ahmed H; Jilda Bolton (jildagayle@gmail.com)
Subject: Re: Letter of reference for Dr. Alex Dimakis
Importance: High

Dear Carole,

Here is my recommendation letter. Please acknowledge.

Best regards,
Raymond

Raymond W. Yeung (S'85-M'88-SM'92-F'03) was born in Hong Kong on June 3, 1962. He received the B.S., M.Eng., and Ph.D. degrees in electrical engineering from Cornell University, Ithaca, NY, in 1984, 1985, and 1988, respectively.

He was on leave at Ecole Nationale Supérieure des Télécommunications, Paris, France, during fall 1986. He was a Member of Technical Staff of AT&T Bell Laboratories from 1988 to 1991. Since 1991, he has been with The Chinese University of Hong Kong, where he is now Choh-Ming Li Professor of Information Engineering and Co-Director of Institute of Network Coding. He is also a Changjiang Chair Professor at Xidian University (2009-12) and an Advisory Professor at Beijing University of Post and Telecommunications (2008-11). He has held visiting positions at Cornell University, Nankai University, the University of Bielefeld, the University of Copenhagen, Tokyo Institute of Technology, and Munich University of Technology. He was a consultant in a project of Jet Propulsion Laboratory, Pasadena, CA, for salvaging the malfunctioning Galileo Spacecraft and a consultant for NEC, USA.

His research interests include information theory and network coding. He is the author of the textbooks *A First Course in Information Theory* (Kluwer Academic/Plenum 2002) and its revision *Information Theory and Network Coding* (Springer 2008), which have been adopted by over 60 institutions around the world. His second book has also been published in Chinese (Higher Education Press 2011, translation by Ning Cai *et al.*).

Dr. Yeung was a member of the Board of Governors of the IEEE Information Theory Society from 1999 to 2001. He has served on the committees of a number of information theory symposiums and workshops. He was General Chair of the First and the Fourth Workshops on Network, Coding, and Applications (NetCod 2005 and 2008), a Technical Co-Chair for the 2006 IEEE International Symposium on Information Theory, and a Technical Co-Chair for the 2006 IEEE Information Theory Workshop, Chengdu, China. He currently serves as an Editor-at-Large of *Communications in Information and Systems*, an Editor of *Foundation and Trends in Communications and Information Theory* and of *Foundation and Trends in Networking*, and was an Associate Editor for Shannon Theory of the *IEEE Transactions on Information Theory* from 2003 to 2005. In 2011-12, he serves as a Distinguished Lecturer of the IEEE Information Theory Society. In spring 2014, he gave the first MOOC on information theory that reached over 25,000 students.

He was a recipient of the Croucher Foundation Senior Research Fellowship for 2000/2001, the Best Paper Award (Communication Theory) of the 2004 International Conference on Communications, Circuits and System (with C. K. Ngai), the 2005 IEEE Information Theory Society Paper Award (for his paper "Linear network coding" co-authored with S.-Y. R. Li and N. Cai), and the Friedrich Wilhelm Bessel Research Award of the Alexander von Humboldt Foundation in 2007. He is a Fellow of the IEEE and the Hong Kong Institution of Engineers.